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Telephony

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Telephony.

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CURRENT OPINIONS AND COMMENTS

One important effect of the "Hall Memorandum," defining the Bell policy with regard to the purchase or consolidation of telephone properties, should be to inspire telephone companies in the field to go ahead, buy needed equipment and begin active work on a construction and extension program.

As President MacKinnon of the national association says, this announcement of the Bell organization "should stabilize the minds of all telephone managers who have been doubtful as to the policy to be followed in the management and development of their properties. The road we are to follow now is plain—let's go!"

* * * *

The public demand for a single telephone service to a community, and the disposition of state commissions to secure a closer relationship between neighboring companies, has caused more or less uncertainty among many telephone men, and that uncertainty has led them, in many instances, to go slow in their development work.

They have postponed buying equipment, and tried to squeak along with as little building as possible. General business conditions have helped to make this standstill, waiting policy seem prudent.

At this time, however, it would appear to be good judgment to get busy and put their plants in order. The telephone business is here to stay and it is bound to expand. The companies that prepare for business will get business, and those who desire to succeed should plan to take care of the patronage that is waiting at their door, or that can be secured by being ready to handle it.

* * * *

The point may be raised that Vice-President's Hall's letter contains conditions and exceptions that reduce the force of his denial that the Bell has adopted or is about to adopt a general policy of buying other plants. Those willing to accept the face value of that denial, however, say these exceptions are not surprising in view of the public sentiment already cited.

State commissions or local community organizations may demand adjustments in the telephone industry that may compel further changes in operation and ownership. It is difficult to cover all such contingencies specifically in a letter, and it is extremely likely that every word in Vice-President Hall's communication was scrutinized and weighed with scrupulous care before it was consigned to the mail for delivery to the United States Independent Telephone Association.

* * * *

The same study has been given the wording of the Bell statement by the Independent leaders, and they call special attention to the first two sentences in the second paragraph of the Hall Memorandum which read:

"First of all, I wish to reiterate in just as strong language as I can state it, that the report that this company (The A. T. & T. Co.) and its associated companies have adopted or are about to adopt a general policy of purchasing or consolidating with connecting or duplicating companies is entirely without foundation. As a matter of fact, the general policy of this company and its associated companies is today, and so far as we can foresee will continue to be, not to purchase or consolidate connecting or duplicating companies except in special cases."

* * * *

Provision is made for such special cases—meaning where public opinion dictates adjustments—which are to be handled only with the knowledge of the Independent association.

It is on the above-quoted statements that the Independent leaders base the opinion that the Hall Memorandum is "a solemn pledge to the people of the country that the Bell group has no monopolistic designs and recognizes the value of making all its moves in the open and doing its part to preserve the integrity of the Independent group."

* * * *

Telephone companies operating in territory where state road-building projects are being carried on in an organized, extensive way are being put to considerable trouble and expense by the necessity of relocating pole lines. The widening of highways compels the moving of poles in many cases, but the telephone company will do well to know its ground fully before carrying out requests or orders received.

* * * *

A bulletin recently issued by the Illinois Telephone Association covers the

matter very well and is worth attention. It reads:

"It is inevitable that in some cases the construction of hard roads will necessitate the relocation of your telephone lines. You are warned, however, against needless shifting of your pole lines, and this office suggests that, when you are advised that a pole line must be moved, you insist upon having such advice and an official relocation of your line come from an authorized representative such as the engineer in charge of the division of highways, department of public works and buildings.

"Refuse to shift your lines upon any request made by the contractor unless it is supported by such official notice."

* * * *

Most of the excessive war taxes imposed on business have been repealed or reduced in the last four years, and rightly so. The war created an emergency that forced the government to rake and scrape additional revenue wherever it could be uncovered, and with the passing of the emergency it was not only just but necessary to lighten the burden.

The enormous increases of the postage rate on second class mail matter which were saddled on the publishing industry during the war, however, have not been removed, or reduced, and the situation presents an unfair condition that should be rectified without further delay.

* * * *

Four annual increases in second-class rates have been levied since 1917, aggregating an advance over the pre-war rates ranging from 100 to 900 per cent. The burden was severe even during the boom time of the war, and many publishers found it necessary to change from the old custom of mailing at the home office.

They have found it economical to make shipments by fast freight or express for the greater part of the haul rather than pay the increased postage rate. Only the largest publishers can pursue this course. A large majority could only reduce their mailing to the minimum, and they are still laboring under a discriminatory tax originally imposed upon them as a war measure, while other industries have been given relief from similar emergency taxation.

* * * *

Congress should reduce the existing high rates on second-class matter, not only in fairness to the publishing industry but for the reason that a lower rate would stimulate business and by a greater volume add to the revenues of the post-office department.

A bill has been introduced in Congress by Representative Kelly of Pennsylvania that will afford relief and enable the post-office to compete with express companies in handling bulk mail matter. The post-office department recognizes the equity of reducing the war-time mailing rates, and believes also that such reduction would add to the receipts of the department.

* * * *

The publishers do not ask for a return to pre-war rates, but for only a modification, retaining in effect an increase of approximately 175 per cent over the pre-war schedule. There can be no doubt as to the equity of this contention. Wholly aside from the undeniable fact that the circulation of reading matter is in the service of the public, it is equally recognized that the volume of first class mail is increased according to the volume of second class matter. Business sense, as well as ordinary justice, recommends the reduction of the second class postage rate.

Foreign Wire Relations' Problems

The Great Necessity for a Cordial and Close Relationship Between Telephone and Power Companies—Features in the Proper Construction of Jointly-Occupied Pole Lines—Paper Presented at Plant School of Purdue University

By W. H. Curran
Plant Engineer, Indiana Bell Telephone Co.

There are so many different subjects and problems with which the telephone officials of today are confronted, and on account of which our time is so taken up, that at times I wonder how we can care for them all and not have something suffer. There is one problem that confronts us all, however, to a greater or less degree, and one we cannot afford to overlook—that is the matter of foreign wire relations.

We, of course, are in the communication business and naturally our first duty is to render the best service possible to the communities we serve. To accomplish this mission we must then continue to render good service, and to continually add to and improve our plant in advance of the expansion of industry and the growing demands on the service.

There are many features in the construction of a telephone property that must be given careful consideration, because of the highly sensitive character of telephone circuits. When the difficulties of this construction are increased through outside forces, the problem is made still more difficult, and unless overcome, the quality of service is lowered, if not entirely destroyed.

During the period of our development there has been an equally important public service utility expanding and bending every effort to keep up with the industrial and commercial growth of the country—that is the electric power industry. It is the development of this industry that we are most concerned in, as it is becoming a serious factor in the operation of our lines in those localities where the voltages are of such a character as to cause interference with the communication circuits.

Up until a comparatively few years ago, however, the problems of interference to the telephone plant from power circuits was confined to the cities, with here and there a high voltage transmission line. For many years the telephone industry has been developed in the rural districts and between cities, so that now there are few localities that are not served by communication circuits.

Now the power development has reached what might be termed its second stage, which is the development of the high voltage transmission line, the linking together of large power plants, cities and towns, and the furnishing of power to the rural districts. This expansion has been very rapid, and undoubtedly is still in its infancy, to what the development will be in a few years.

I think we can well expect the expansion of the electric power industry to be as extensive as that of the communication company. In fact, the construction of power lines has been so rapid and heavy in some localities that now our lines are parallel, overbuilt and crossed so generally, as to seriously interfere with the rendering of good service.

In the first place, telephone circuits are much more sensitive than power lines, and for this reason can be seriously affected by close proximity with power circuits. There is no possibility of currents used on telephone circuits affecting transmission lines. For this reason, therefore, the two classes of circuits cannot be considered on the same basis.

Up to a certain point, it has been possible to reduce inductive interference in the telephone circuits, through various methods, but the development of high voltage circuits has been so rapid that it is now no longer possible to confine all the corrective measures in our own lines, as has been the practice in the past, and co-ordinated methods must be applied.

Power induction on telephone lines may be reduced by co-ordinated transpostions in both lines, through design of power apparatus, and by balancing of the phase wires. These measures may produce somewhat satisfactory results, but in long parallels there is usually a certain amount of noise which results in impairment to service. At times of abnormal disturbances, which may be caused by broken insulators, line breaks, switching, etc., neither transposition in the power nor in the telephone circuits will avoid failure in the telephone circuits. As stated previously, there are cases where certain measures can be applied, where interference may be reduced, but there will be instances where complete separation of the lines is the only practicable remedy.

It is generally acknowledged, I believe, that the conditions mentioned exist. Our problem is, therefore, to reduce the number of cases of interference to a minimum and to avoid the introduction of new like conditions; and to work out a plan whereby the public may obtain the maximum benefit of these services at the minimum cost, without interference one with another.

To start with, there are three considerations: First, the telephone companies have generally developed the present productive territory, and are now occupying highways outside cities, for rural service and intercity circuits; second, the power industry is now developing rural communities and is constructing high voltage transmission lines between power plant and cities; and third, both utilities will make extensions into new territory as it develops.

There is only one satisfactory solution to the problem, as I see it, and that is through the development of close relationship between the two industries. There should not be any necessity for resorting to legal actions on the part of either utility, for the facts are that the services of both are for the benefit of the public, and it is entitled to continuous and uninterrupted service from both. It is, therefore strictly the responsibility of each utility to so construct and maintain its property in such a manner as not to interfere in any manner with the operation of one with the other.

Take the first condition just mentioned —that of the telephone circuits occupying routes that the power circuits are to be extended on—the telephone company has a right of priority to the location it is occupying, and this must be given consideration by any incoming utility. The telephone company must maintain service of good quality, and the power company has no equitable right to do anything that would cause an impairment of the telephone service.

It is clearly the responsibility of the power company to so arrange its circuits as not to cause any interference or hazards to the existing property. If co-ordinated methods are required to insure satisfactory service, then it is the duty of the power company to arrange for these measures, and the duty of the telephone company to work, co-operate and arrange its plant to meet the new conditions.

In the event that alternate routes are available, it is felt that the power circuits should be located on such a route, thus avoiding expensive changes in the property of the company, whose plant is affected by the new extension. This is particularly true in the case of long parallels of high voltage transmission lines.

Assuming the case of a route occupied by a power lead, and an extension of telephone circuits is contemplated, the same conditions should apply; the telephone line should be located away from the parallel if practicable, or if not, the telephone company should arrange for the necessary changes in the power circuits.

Another case comes to mind; where two telephone lines occupy both sides of a highway, and a power line extension is planned, it seems to me that the communication circuits should be consolidated on one lead on one side of the highway and the opposite side cleared for the power circuits. These same conditions should apply in the event both sides of a highway were occupied by power circuits; one side should be cleared for the telephone circuits.

In the case of extensions into new territory, the utilities should get together and determine what is required, and lay out their plans to avoid conflicts or interferences between properties before starting work.

The time to determine what is required in each case is before any expenditures are made. In order that this may be done, cultivate the acquaintance of the power people, learn something of their problems, and be frank and honest in presenting your own situation. It is only through this contract that we will be able to gain the confidence of the power utilities, and convince them of our sincerity in this vital matter.

We must not make unreasonable demands on them, neither must we incur unwarranted expense in making changes in our lines. We must realize that both companies are serving the public and that it is the service we are rendering the public that must be insured, and that no conditions can be permitted to be built up in either plant that will impair this service in any manner.

So far as I have gone, this paper has pertained principally to those power circuits of a high voltage nature, usually considered by telephone people as anything over 5,000 volts. You will know the reason for this limitation, so there is no need of going into that further at this time.

I now want to discuss the lower voltage power lines and the opportunities of savings to the companies, in using jointly constructed pole lines. This is a subject that we are having to meet more and more every year, and now that our power friends are expanding to a greater extent than ever before, the immediate needs for proper construction and maintenance of both telephone and power plants are more readily realized.

We all realize the necessity for proper maintenance to the rendering of high grade telephone service. We know what it means to keep our lines free from tree grounds, broken insulators, slack, loose guys, etc., and the necessity for nearly perfect balance in our lines, and that these things are essential whether we are in close proximity to power lines or not, so that when we become involved in parallels with power circuits, our problems become still greater, and still more importance must be attached to our maintenance work.

In the first place we are agreed, I believe, that the telephone plant must be kept free from conflict or interference from all high tension lines. This should be done by complete separation, by means of different right-of-way, alternate highway routes, etc., or at the least by highway separation, and in this case special co-

Keep Ahead of Your Work.

The person who feels an instinctive dislike to tackling the day's work as he starts to business should find out what's wrong. If he forces himself to go through the paces he will hold down a job, perhaps, but will he make a success of it? The chances are all against it. The really efficient worker is the one whose mind and body are attuned to his tasks, who doesn't let his work get ahead of him, or "on his nerves," and who does it happily, interestedly, and enthusiastically. He never makes the mistake of thinking that smiles were made for leisure hours only, but carries them to business with him. Watch out for him. He's the man to get ahead.
—Telephone Review.

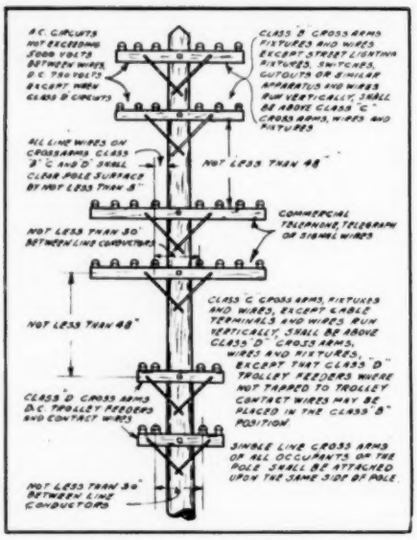

A.C. CIRCUITS NOT EXCEEDING 5000 VOLTS BETWEEN WIRES, D.C. 750 VOLTS EXCEPT WHEN CLASS 'B' CIRCUITS
CLASS 'B' CROSS ARMS, FIXTURES AND WIRES EXCEPT STREET LIGHTING FIXTURES, SWITCHES, CUTOUTS OR SIMILAR APPARATUS AND WIRES RUN VERTICALLY, SHALL BE ABOVE CLASS 'C' CROSS ARMS, WIRES AND FIXTURES
ALL LINE WIRES ON CROSS ARMS, CLASS 'B', 'C' AND 'D' SHALL CLEAR POLE SURFACE BY NOT LESS THAN 5"
NOT LESS THAN 40"
NOT LESS THAN 30" BETWEEN LINE CONDUCTORS
COMMERCIAL TELEPHONE, TELEGRAPH OR SIGNAL WIRES
NOT LESS THAN 40"
CLASS 'C' CROSS ARMS, FIXTURES AND WIRES, EXCEPT CABLE TERMINALS AND WIRES RUN VERTICALLY, SHALL BE ABOVE CLASS 'D' CROSS ARMS, WIRES AND FIXTURES, EXCEPT THAT CLASS 'D' TROLLEY FEEDERS WHERE NOT TAPPED TO TROLLEY CONTACT WIRES MAY BE PLACED IN THE CLASS 'B' POSITION
CLASS 'D' CROSS ARMS D.C. TROLLEY FEEDERS AND CONTACT WIRES
SINGLE LINE CROSS ARMS OF ALL OCCUPANTS OF THE POLE SHALL BE ATTACHED UPON THE SAME SIDE OF POLE
NOT LESS THAN 30" BETWEEN LINE CONDUCTORS

Fig. 1. Relative Position of Attachments of the Different Classes.

ordinated transposition schemes applied to both lines.

We, therefore, have certain classes of power lines which we do not want to be involved with in any manner. However, these cases are the exception rather than the rule, and for the most part are capable of solution to the satisfaction of both interests.

Eliminating those cases mentioned, we have in all locations overhead plant of both systems, that parallel and serve the same areas, where a great economy may be effected by consolidating the services on one pole line, and it is to this end that we should work.

As a rule, joint construction between telephone and supply circuits may be safely used when the supply circuits do not carry voltage or current in excess of:

(a) Constant potential, alternating current, not exceeding 5,000 volts between wires, or 2,900 volts normally to ground.

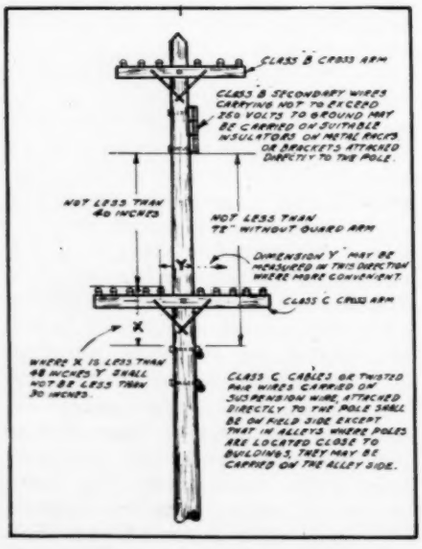

CLASS 'B' CROSS ARM
CLASS 'B' SECONDARY WIRES CARRYING NOT TO EXCEED 150 VOLTS TO GROUND MAY BE CARRIED ON SUITABLE INSULATORS ON METAL RACKS OR BRACKETS ATTACHED DIRECTLY TO THE POLE
NOT LESS THAN 40 INCHES
NOT LESS THAN 72" WITHOUT GUARD ARM
DIMENSION 'Y' MAY BE MEASURED IN THIS DIRECTION WHERE MORE CONVENIENT
CLASS 'C' CROSS ARM
WHERE 'X' IS LESS THAN 48 INCHES 'Y' SHALL NOT BE LESS THAN 30 INCHES
CLASS 'C' CABLES OR TWISTED PAIR WIRES CARRIED ON SUSPENSION WIRE ATTACHED DIRECTLY TO THE POLE SHALL BE ON FIELD SIDE EXCEPT THAT IN ALLEYS WHERE POLES ARE LOCATED CLOSE TO BUILDINGS, THEY MAY BE CARRIED ON THE ALLEY SIDE.

Fig. 2. Class "B" Secondary Wires and Class "C" Suspension Wires Attached Directly to Pole.

(b) Constant potential direct current, not exceeding 750 volts, constant current, series metallic line current not exceeding 7.5 amperes.

(c) When systems using lamps operating at currents in excess of 7.5 amperes, but equipped with compensators or transformers so that the line current does not exceed 7.5 amperes.

(d) Constant potential, direct current, trolley contact wire and feeder not exceeding 750 volts to ground.

These conditions apply to all classes of telephone plant, with the exception of open-wire toll circuits. It is highly desirable that all toll lines be kept free from parallel or overbuilds with supply circuits, and every effort should be made to accomplish this.

There are cases where it will be necessary to make a joint lead with toll and supply circuits, but as a rule I have found these can be avoided. Telephone toll lines may be likened to the transmission supply lines in that they are the trunk feeders of the telephone system, and being of highly important character, all possibilities of interruptions must be guarded against.

In every case of extensions into new territory, the telephone company should advise with the power representatives, and determine in advance what work is to be done, and the power company should reciprocate in a like manner. The same conditions apply in rebuilding or reconstruction work. If both interests will advise with each other, there will result a closer relation with the desired improved plant conditions and savings to both.

There are various reasons as to why the wire companies should consider joint pole construction in all new extensions and reconstruction when this can be done without interference to the service of either company. Not only is there economy to the companies in pole costs, but the safety of the employes, and the property of both companies is to be considered, as well as the civic appearances. It is highly important that pole line construction be as inconspicuous as possible. This cannot be done if the utilities continue to use larger numbers of poles, each in a separate line and located on the same streets and alleys.

In many parts of the country there are city ordinances which are very drastic as regards pole line construction, and joint use is compulsory. These laws were passed and in many instances resulted in expensive changes in the properties of all the wire-using utilities. From my experience I have observed that if the utilities go ahead on their own initiative in matters of this kind, they can forestall unfavorable legislation, and secure much more favorable plant conditions at less expense to themselves and the public, and certainly without unpleasant notoriety through the activities of overzealous politicians.

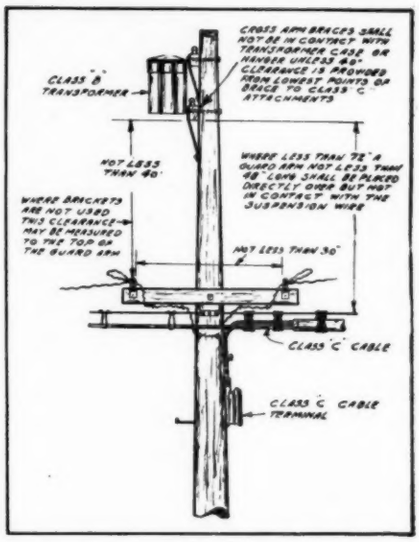

CROSS ARM BRACES SHALL NOT BE IN CONTACT WITH TRANSFORMER CASE OR HANGER UNLESS 40" CLEARANCE IS PROVIDED FROM LOWEST POINTS OF BRACE TO CLASS 'C' ATTACHMENTS
CLASS 'B' TRANSFORMER
NOT LESS THAN 40"
WHERE LESS THAN 72" A GUARD ARM NOT LESS THAN 48" LONG SHALL BE PLACED DIRECTLY OVER BUT NOT IN CONTACT WITH THE SUSPENSION WIRE
WHERE BRACKETS ARE NOT USED THIS CLEARANCE MAY BE MEASURED TO THE TOP OF THE GUARD ARM
NOT LESS THAN 30"
CLASS 'C' CABLE
CLASS 'C' CABLE TERMINAL

Fig. 3. Location of Class "B" Transformer.

There are several forms of joint agreements such as:

(a) The joint ownership contract;

(b) The pole rental agreement, and others.

There are points in favor of either of these agreements but the pole rental agreement, I believe, covers the situation the best of any in use. Under this form of contract, each company owns entirely its own poles, but grants to the joint-user the rights of occupancy for a flat per annum rental. This rate is based on the cost of the average pole in plant, usually a 30-ft. or 35-ft. pole. A rate is developed on the basis of the annual charge, and the renting company pays one-half of the annual charge.

The intent of this agreement is for the companies to maintain a balance of poles jointly occupied—that is, equal or as nearly so as is practicable. If this is done, there will be a minimum of billing ex-

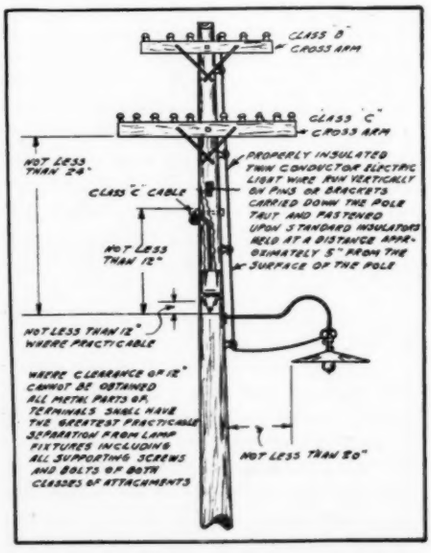

CLASS 'B' CROSS ARM
CLASS 'C' CROSS ARM
NOT LESS THAN 24"
PROPERLY INSULATED TWIN CONDUCTOR ELECTRIC LIGHT WIRE RUN VERTICALLY ON PINS OR BRACKETS CARRIED DOWN THE POLE THRU AND FASTENED UPON STAGGERED INSULATORS HELD AT A DISTANCE APPROXIMATELY 5" FROM THE SURFACE OF THE POLE
CLASS 'C' CABLE
NOT LESS THAN 12"
NOT LESS THAN 12" WHERE PRACTICABLE
WHERE CLEARANCE OF 12" CANNOT BE OBTAINED ALL METAL PARTS OF TERMINALS SHALL HAVE THE GREATEST PRACTICABLE SEPARATION FROM LAMP FIXTURES INCLUDING ALL SUPPORTING SCREWS AND BOLTS OF BOTH CLASSES OF ATTACHMENTS
NOT LESS THAN 80"

Fig. 4. Street Lamp Fixture on Jointly Occupied Pole, Twin Conductor on Pins and Insulators.

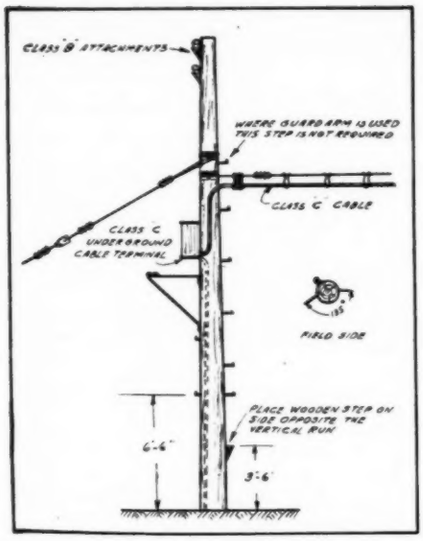

CLASS 'B' ATTACHMENTS
WHERE GUARD ARM IS USED THIS STEP IS NOT REQUIRED
CLASS 'C' CABLE
CLASS 'C' UNDERGROUND CABLE TERMINAL
FIELD SIDE
PLACE WOODEN STEP ON SIDE OPPOSITE THE VERTICAL RUN
6'-6"
3'-6"

Fig. 5. Joint Pole With Underground Subsidiary Cable and Terminal.

pense. In the event of new extensions, that company which is using the lesser number of poles would make the extensions. Each company cares for such changes as are necessary in its own wires or cables at its own expense.

There are numerous conditions which are involved in the construction and maintenance of an aerial telephone plant, and in general these same conditions apply to the supply lines. When both plants, therefore, are joined on the same supporting structures, it is necessary that all conditions be covered in a manner satisfactory to both services. For example, there is the scope and limitation of the circuits that can be considered for joint occupancy of a pole line. Then follow the relative positions of the attachments; clearance, vertical and horizontal, supporting fixtures such as crossarms, pins and insulators, brackets, lamp fixtures and terminals, guying and stepping of poles.

Here are some sketches which cover the

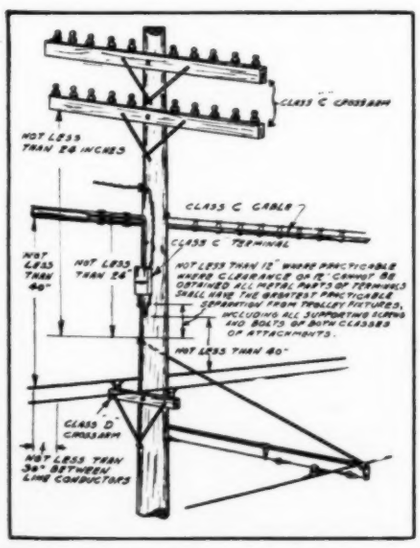

CLASS 'C' CROSSARM
NOT LESS THAN 24 INCHES
CLASS C CABLE
CLASS C TERMINAL
NOT LESS THAN 40"
NOT LESS THAN 24"
NOT LESS THAN 12" WHERE PRACTICABLE WHERE CLEARANCE OF 12" CANNOT BE OBTAINED ALL METAL PARTS OF TERMINALS SHALL HAVE THE GREATEST PRACTICABLE SEPARATION FROM TROLLEY FIXTURES, INCLUDING ALL SUPPORTING SCREWS AND BOLTS OF BOTH CLASSES OF ATTACHMENTS.
NOT LESS THAN 40"
CLASS 'D' CROSSARM
NOT LESS THAN 30" BETWEEN LINE CONDUCTORS

Fig. 6. Trolley Bracket Attachment on Joint Pole.

usual types of construction that are met in our every-day work. We will go over each one, and I will point out the most important things that are covered, and that should be carefully followed out.

Fig. 1 shows the relative position of attachments of different classes with the vertical clearances and climbing spaces. The supply circuits are in the top spaces, with a vertical clearance of not less than 48 inches from the lowest supply crossarm to the nearest signal crossarm.

The climbing space is not less than 30 inches between the pole pins on the signal crossarms. The supply circuits, which are known as class *D*, such as trolley feeders, or contract wires, are located at least 48 inches below the lowest signal crossarm.

The relative positions of the supply and signal attachments, and the methods of securing climbing space by close spacing pins on class *C* crossarms are shown in Fig. 2. Note that the secondary wires may be 40 inches from class *C* wires, and that 72 inches is maintained between secondary class *B* circuits and supply cables attached directly to the pole.

In Fig. 3 is presented one of the conditions that is the source of considerable controversy between companies on the matter of joint pole use.

The location of transformers should, whenever practicable, be above class *C* circuits. This can be done in most cases unless the transformers are over 50 kilowatt capacity, in which event special conditions require that the apparatus be placed in a lower position.

In no case is it recommended that cable terminals be placed on the same poles with transformers, if these are located below the terminal position. In Fig. 3 a special guard arm is placed above the cable strand wire when the separation between the class *B* and *C* circuits is less than 72 inches. This is to insure safety to linemen working on the class *B* circuits. It should also be noted that the climbing space is cleared by making distribution from the guard arm.

One of the most frequent cases of trouble and interference on jointly-occupied poles is in the case of street lighting drops.

In Fig. 4 is shown a safe method of cabling from the incandescent street lamp to the class *D* circuit on the top space of the pole. Note the pins and brackets for supporting the twin conductor cable, also the clearance between the lamps and the class *C* circuits.

It is not satisfactory to attach the lamp drops to pins fastened on the ends of the crossarms, and this practice should not be permitted.

The relative position of the class *B* and *C* circuits when the latter consists of cable is indicated in Fig. 5. The pole steps are quartered on the pole to avoid injury to the underground cable that terminates on this pole. Note that no steps are provided above the class *C* attachments; also, that

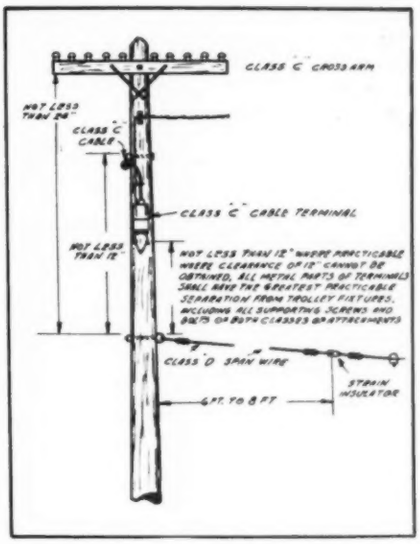

CLASS 'C' CROSS ARM
NOT LESS THAN 24"
CLASS 'C' CABLE
CLASS 'C' CABLE TERMINAL
NOT LESS THAN 12"
NOT LESS THAN 12" WHERE PRACTICABLE WHERE CLEARANCE OF 12" CANNOT BE OBTAINED, ALL METAL PARTS OF TERMINALS SHALL HAVE THE GREATEST PRACTICABLE SEPARATION FROM TROLLEY FIXTURES, INCLUDING ALL SUPPORTING SCREWS AND BOLTS OF BOTH CLASSES OF ATTACHMENTS
CLASS 'D' SPAN WIRE
STRAIN INSULATOR
6 FT. TO 8 FT.

Fig. 7. Trolley Span Wire Attachment on Joint Pole.

the guy dead-end and the messenger strand are separated at the point of attachment on the pole.

Figs. 6 and 7 illustrate the method and position for attaching trolley span wires and trolley brackets on joint poles.

In both cases the strain insulators are placed in both strand wires supporting the trolley wire. The use of strain insulators is highly important, and no trolley wire attachment should be permitted, unless these are provided.

In Fig. 8 is shown the method of guying, and the location of strain insulators in anchor guys. Two insulators are placed in each guy—one at the end next to the pole, and one at the anchor end of the guy. These insulators must be installed in all guys and care taken to see that they are properly located within the allowable measurements, as shown.

All guys should be placed so as to maintain at least six inches' clearance from the nearest line wire at the point of attachment on the guyed pole. Clearance of at

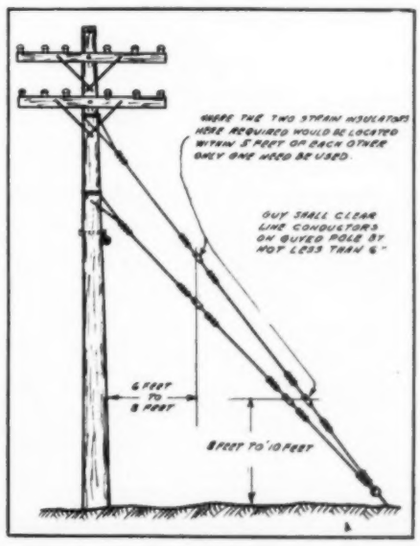

WHERE THE TWO STRAIN INSULATORS HERE REQUIRED WOULD BE LOCATED WITHIN 3 FEET OF EACH OTHER ONLY ONE NEED BE USED.
GUY SHALL CLEAR LINE CONDUCTORS ON GUYED POLE BY NOT LESS THAN 6"
6 FEET TO 8 FEET
8 FEET TO 10 FEET

Fig. 8. Anchor Guys on Joint Poles.

least two feet should be maintained between any wires passed over or under by the guy wire.

Insulators, Fig. 9, are placed in head guys in the same manner and under the

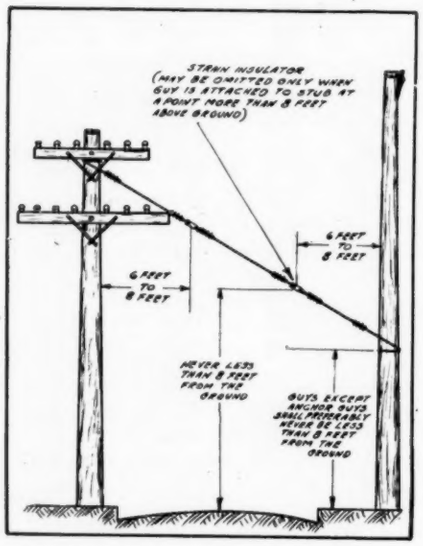

STRAIN INSULATOR
(MAY BE OMITTED ONLY WHEN GUY IS ATTACHED TO STUB AT A POINT MORE THAN 8 FEET ABOVE GROUND)
6 FEET TO 8 FEET
6 FEET TO 8 FEET
NEVER LESS THAN 8 FEET FROM THE GROUND
GUYS EXCEPT ANCHOR GUYS SHALL PREFERABLY NEVER BE LESS THAN 8 FEET FROM THE GROUND

Fig. 9. Head Guys on Joint Poles.

same conditions as they are added in anchor guys, except that the insulator at the lower end of the head guy may be omitted if the point of attachment is more than eight feet above the ground.

The points that have been covered are briefly summarized in order to emphasize the important features of both relation work with the power companies and the necessity for proper construction in jointly-occupied pole lines:

First: There must be built up cordial and close relationship between the telephone and power companies, which will result in the exchange of notices of contemplated construction and prompt co-operation.

Second: We must take time to learn something about the other fellow's problems, and make clear to him our problems, with the object of determining the best practical and engineering solution.

Third: Freedom from foreign wire interference by:

(a) Preventing the further growth of bad conditions, and

(b) To gradually eliminate existing conditions.

Fourth: Proper rules governing overhead construction. This is a matter which is now being taken care of through the commendable efforts of your association, and the benefits that will obtain upon adoption of a correct set of rules will be well worth the time and effort that has been and will be spent in preparing them.

Fifth: A good practical form of joint pole agreement, included in which should be specifications covering the type of construction to be followed by both users.

Sixth: Outside plant constructed on a sound design, and properly constructed, followed by efficient and economical maintenance. In this connection watch particularly for:

(a) Substantial poles properly located and set.

(b) Strong corners.

(c) Proper guying, and particluarly the placing of strain insulators.

(d) Clearances between different classes of circuits both horizontally and vertically.

(e) Climbing spaces.

Summaries of Reports of Class A Companies for April.

The April statement—shown on this page—just issued by the Bureau of Statistics of the Interstate Commerce Commission contains the revenues and expenses of 71 Class A companies reported during the month.

There were 468,372 more stations last April than in April, 1921. The revenue from subscribers' stations has increased nearly 6 per cent, while the average increase for the first four months of 1922 over the same period in 1921 was a trifle more than 9 per cent.

The miscellaneous exchange service revenues fell 3.5 per cent below those in April of last year but the average for the four months shows an advance of 1.0 per cent over 1921. The remaining items of income had an upward trend.

Traffic expenses have started to climb, being 2.3 per cent greater last April than the previous April. The four-month average represents a decrease of 1.2 per cent. Other expenses were also higher for the month.

The operating income was 4 per cent more in April, 1922, than in 1921, while the average for the four months was 15.5 per cent greater than for the first four months of last year.

The ratio of expenses to revenues was 70.20 per cent in 1922, a decrease of 0.6 per cent from 1921. The decrease for the four months was 3.4 per cent.

Picketing by Telephone—Kansas Governor Hears of Threats.

A new angle in strike picketing, "telephone picketing," has come to Governor Allen, of Kansas, in several reports that railroad shopmen who had not gone out, or members of their families, had been called over the telephone, followed by argument, persuasion and regret that something "unpleasant" was bound to happen if "scabbing" didn't cease.

Item.	For the month of April. 1922.	1921.	Increase or decrease (*). Amount.	Ratio, Pct.	For the four months ending with April. 1922.	1921.	Increase or decrease (*). Amount.	Ratio, Pct.
Number of company stations in service at end of month	10,004,799	9,536,427	468,372	4.9	.....	.....	.....	...
Revenues:								
Subscribers' station revenues	$31,190,047	$29,498,482	$1,691,565	5.7	$123,230,150	$112,894,952	$10,335,198	9.2
Public pay station revenues	2,184,795	2,103,755	81,040	3.9	8,532,326	8,224,982	307,344	3.7
Miscellaneous exchange service revenues	404,448	419,043	*14,595	*3.5	1,685,366	1,668,074	17,292	1.0
Message tolls	11,930,045	11,317,884	612,161	5.4	46,455,014	44,041,498	2,413,516	5.5
Miscellaneous toll line revenues	1,339,209	1,246,619	92,590	7.4	5,382,639	5,041,148	341,491	6.8
Sundry miscellaneous revenues	791,258	653,404	137,854	21.1	3,179,585	2,596,289	583,296	22.5
Licensee revenue—Cr.	1,709,854	1,567,172	142,682	9.1	6,942,484	6,368,037	574,447	9.0
Licensee revenue—Dr.	1,707,013	1,559,522	147,491	9.5	6,937,398	6,363,154	574,244	9.0
Telephone operating revenues	$47,842,643	$45,246,837	$2,595,806	5.7	$188,470,166	$174,471,826	$13,998,340	8.0
Expenses:								
Depreciation of plant and equipment	$ 7,028,041	$ 6,265,398	$ 762,643	12.2	$ 27,775,373	$ 24,758,372	$ 3,017,001	12.2
All other maintenance	6,658,375	6,396,808	261,567	4.1	26,435,220	24,993,052	1,442,168	5.8
Traffic expenses	13,149,772	12,852,293	297,479	2.3	51,843,328	52,488,870	*645,542	*1.2
Commercial expenses	4,412,505	4,247,577	164,928	3.9	17,610,083	16,729,591	880,492	5.3
General and miscellaneous expenses	2,334,466	2,178,942	155,524	7.1	9,112,631	8,263,510	849,121	10.3
Telephone operating expenses	$33,583,159	$31,941,018	$1,642,141	5.1	$132,776,635	$127,233,395	$5,543,240	4.4
Net telephone operating revenues	$14,259,484	$13,305,819	$ 953,665	7.2	$ 55,693,531	$ 47,238,431	$ 8,455,100	17.9
Other operating revenues	711	3,628	*2,917	*80.4	3,565	14,469	*10,904	*75.4
Other operating expenses	636	2,658	*2,022	*76.1	5,839	12,954	*7,115	*54.9
Uncollectible operating revenues	231,870	154,027	77,843	50.5	899,338	568,740	330,598	58.1
Operating income before deducting taxes	14,027,689	13,152,762	874,927	6.7	54,791,919	46,671,206	8,120,713	17.4
Taxes assignable to operations	3,573,271	3,096,906	476,365	15.4	14,356,376	11,649,740	2,706,636	23.2
Operating income	$10,454,418	$10,055,856	$ 398,562	4.0	$ 40,435,543	$ 35,021,466	$ 5,414,077	15.5
Ratio of expenses to revenues, per cent	70.20	70.59	*.39	*.6	70.45	72.92	*2.47	*3.4

Statistics of Operations for April, 1922, of Class A Telephone Companies, Compiled by Interstate Commerce Commission.

Straight Talks Between Operators

Courtesy and Dispatch Important in Dealing with People—Operator Responsibilities in Small Towns—Avoiding Canceled Calls—Advertising Value of Furnishing Good Service—Papers Presented at Iowa Operators' Schools

Courtesy and Dispatch.

By Catherine Wellenday,
Operator, Plymouth County Telephone Co., Le Mars, Iowa.

Courtesy should come natural as it is one of the first lessons most of us learned from our mothers.

Do you not remember, when you were a wee, tiny tot, lisping out, "Thank you," to some one who had given you something? You would not have known enough at that early age to have instinctively said, "Thank you"—but you would have reached for the candy quickly. Your mother taught you to say "Thank you"—and you have been saying it ever since, especially when you can look people in the eye and say "Thank you."

But, in dealing with people over the telephone do you always remember to say "Thank you" or "Please" when occasion requires it? "No," says someone here, "My patron never 'thanks' nor says 'please' to me."

One moment, please, did your mother teach you that courtesy is a one-sided custom? Did she not teach you that politeness is to do or say the kindest thing in the kindest way to everybody? You poorly represent her early training if you do not do this in your business dealings.

Courtesy is especially important in our dealings with people who by their very lack of understanding of our work are often harsh or sarcastic with us about things often not within our present control.

Real, natural courtesy is politeness combined with kindness. Of course, courtesy must be coupled with dispatch in telephone operating, for our patron cannot see the load of work we are carrying. He realizes when he enters a restaurant which is full of people waiting to be served, and a waiter politely tells him, "Be seated, please, we will take your order as soon as possible," that he must wait his turn. He does not question the dispatch with which the waiters are handling their customers.

Suppose we girls at the central office should plug in on a signal and say to a subscriber, "Be seated, please, we will take care of your order as soon as possible." Well, we don't care to know the result.

Therefore, we are trained to handle our calls accurately—but with courtesy and dispatch. Dispatch is the offspring of routine. Routine is the easiest and shortest way of doing things.

If a thing is to be done but once, the difference between the easy way and the hard way, the long way and the short way, may not be much—but if the process is to be repeated and multiplied, that difference becomes very great. The easiest way to perform any act frequently repeated is through the habit of always following the same process. Thus routine develops dispatch.

"Responsibilities of the Small Exchange Operator."

By Miss Agnes Huffman,
Chief Operator, Mutual Telephone Co. of Mediapolis, Mediapolis, Iowa.

A farmer has two granaries full of wheat—a small granary and a large one. The quality of the wheat is the same. Does he sell the grain in the small bin for less than he does the grain in the larger bin? No, he does not.

It is the same with telephone operators—the operator in the small exchange is just as important to the telephone system (I mean by that the telephone companies as a whole) as the operator in the exchange of a large city. Transfer a local operator in a large city to a small exchange, and she would be useless until she has been trained in the different departments of telephone work, such as local operator, long distance operator, information operator, trouble clerk, cashier, etc., for all these are the duties of one individual operator in the small exchange.

The success of the small exchange depends largely upon the operator, the general thought being that the operator is the telephone company. As she is the first representative of the company to address the subscriber, the patron judges the company, therefore, from the manner in which the operator performs her duties. The operator is responsible for the kind of service the company renders, for of what good are equipment and rules, if the operator does not apply herself?

In most small exchanges the switchboards are of the magneto type, and unless the subscriber remembers to ring off when through talking, the operator does not get the clear-out signal. She must be constantly supervising her connections, while on the switchboards of the larger exchange, the instant the subscriber restores the receiver to the hook, the operator gets the clear-out signal.

Generally in small towns the operator has a large number of acquaintances, and a great many people know the operator. Thus sociability, constantly intruding, helps the operator diverge from rules and methods that make for good service. Some of her subscribers she likes and some she dislikes, but she must not show any partiality. She should use the proper phrases and be courteous and business-like in all her dealings with each patron.

It has been known that skillful mechanics have lost positions or failed to secure positions because they could not resist the temptation to talk to the passer-by or onlooker. In the small exchange the subscribers ask: "Operator, what was the score?" "How bad was the fire?" and "Oh, Central, do you know about Mr. Smith's car upsetting? Was anyone killed?" etc.

Nine times out of ten, the subscribers who ask these questions will try to engage the operator in conversation, but she must constantly keep her mind upon her work. Perhaps there are several signals on her position waiting for her answer; one may want to place a very urgent call to some far-away point; another may want to report a case of trouble on the lines; and still another may be "Central, my clock has stopped. Would you be so kind as to tell me the correct time?"

Whatever nature the call, each should have the operator's undivided attention. Thus, you can readily see how the violation of even one of the rules is an injury to the service and to the operator.

Often she has calls like these: "Central, I want to talk to the oldest boy in John Smith's family"; or "I want to talk to the man who lives on what used to be the old Jones farm, I don't know what his name is"; or "Central, I want the Miller who has cabbage plants for sale. There are so many Millers that I don't know which one it is"; etc. In a large exchange, these calls are taken care of for the operator, so she merely uses the phrase, "I will give you Information."

Under the new toll operating practices that have recently come into use, the tributary operator is relieved of part of the responsibility of toll traffic. She obtains the charges from the toll center at the completion of each toll ticket. The tributary is responsible, however, for the proper recording of her toll tickets so as to make sure that the toll center will not have to obtain other information after the called station has been reached and thus waste valuable circuit time.

In small exchanges having but a one- or two-position switchboard, the matter of training and proper supervision of operators is very difficult. As an extra girl to act as supervisor is out of the question, the only alternative is to train each operator so that she will not need constant supervision. This is not an easy matter, as with the chief operator on duty only during certain hours of the day, rules

are easily forgotten and proper methods neglected.

The operators' training schools have been very valuable to the supervisor or operator of the small exchange. Managers should see that they attend one of these schools. When an operator never hears of better methods of operating, and thinks that her work is satisfactory to her employers, there is no incentive to improve.

Canceled Calls.

By a Chief Operator.

A canceled call is one of the most undesirable features of our toll work, for, in the first place, it represents loss of revenue for the telephone company.

Even though we have secured a chargeable report, we must not be satisfied with this, as the report charge is only about one-quarter of the message charge and not nearly enough to pay for the operator's time and the circuit time used. For example, take one day in our own office. We had 12 lost calls—a very small average—which meant a gross loss of $4.30 of which amount only 80 cents was recovered in report charges, making a net loss of $3.50 per day. This, for a month, would mean a loss of $105, and if figured for a year, over $1,200.

Of course, these figures will vary somewhat, but still they give a fair idea of the amount of money that is really lost by canceled calls.

Then, from the public's standpoint—we must not overlook the fact that canceled calls mean dissatisfied patrons, and they are very poor advertisements for our toll service. Satisfying the patron depends a great deal upon the expression and manner which the toll operator uses in giving reports and her willingness to make further attempts on the call.

You will ask: "Just how can we best avoid canceled calls?" Of course, we all know that it is impossible to complete every call, but I do know from actual experience that by use of our phrases, along with perseverance, we are now completing a larger percentage of calls than we did some time ago.

Regarding phrases, for instance, a report is given the subscriber that the called party is expected today, but they do not know at what time; we ask: "Will you talk with anyone else?" Oftentimes the answer is, "Yes, I will talk with Mrs. Brown, or anyone in the office," as the case may be.

Again, the subscriber will say, "No, just let the call go." In this case, we ask, "May we try to complete your call later, Mr. Smith?" Usually that is sufficient, unless he gives the reason that he is leaving that telephone, but even then our phrase, "You may talk from another telephone if you wish," will take care of that, so he really would be unable to give a good reason for canceling.

Several instances that come to mind might be mentioned where calls would have been lost had we not put forth a little extra effort. For instance, Mr. Brown called a number in Des Moines and upon receiving a *D A* report, said, "Well, let them go; they're probably not at home." By asking, we secured his consent to try the call later and after two or three attempts succeeded in reaching the desired number.

This evidently pleased him for he said, "Thank you, Central, that's fine." So in addition to the revenue gained, we also had made one more satisfied subscriber, and a booster for the company.

We may also receive a report, "Out of the city; expected tomorrow." Here we use the phrase, "May we try to complete your call tomorrow, Mr. Smith?" and carry the ticket forward to the next day, in this way saving a canceled call.

Let us try then to do all we can to better the service, both for the benefit of our patrons and for the company by which we are employed.

Service.

By Miss Fay Johnston,

Chief Operator, Marion County Electric Co., Pleasantville, Iowa.

During the past few years there has come to be a new watchword in business—"Service." Time was when the main idea seemed to be to get the money, but in this day of advanced ideas and higher ideals the successful business is built upon service.

The interest of a manufacturer in his dealer does not cease upon the sale of a stock of goods. He appreciates that his own success depends on the success of that dealer and he does everything he possibly can to the end that the dealer resells the merchandise at a fair profit. In like manner, the dealer is interested in the satisfaction derived by his customer from the use of the merchandise and is anxious to serve him in every possible manner.

If service is a necessary and important element in the successful merchandising of goods, how much more is it tremendously important and absolutely necessary in the conduct of the business in which we are interested? The business of a telephone company is primarily the leasing of its wire and equipment for short periods of time for cash rentals, but the customer can make no use of the rented equipment without the service which goes with it and unless that service is fairly efficient the lessee is being cheated.

We employes of the Marion County Electric Co.—or whatever your company may be called—are selling our services to our employers, who are engaged in selling their service to the public. If we do not give them the best service we are able, we are cheating them in exactly the same way a short-sighted grocer might short-weight a customer—and we can no more expect to advance in position than can the short-sighted grocer expect to be successful in his business if he cheats his trade.

Therefore, every operator must be loyal to her employer, as there is nothing that is more appreciated than a force that an employer can feel is trustworthy.

A telephone is an exasperating instrument. We must be very careful what we say and how we say it when dealing with our patrons. Things that we could say to them face to face would be taken in the best humor, but if repeated over a telephone, word for word, would probably offend them.

One of the most important elements, especially in telephone service, is "courtesy." That is something that sticks in human relations like a postage stamp to a letter. And the company expects it to be used by its employes in dealing with patrons.

It seems to me that there cannot be too much time spent in explaining telephone work to our patrons, and every complaint should be taken in consideration. What we want to do is to humanize telephone service and bring the public to realize that there is no unimportant person or part in our service. It is a total of human units and with the public's co-operation is the key to our success.

Every operator should be impressed with the fact that, when she takes her position at the switchboard, she is to assume the responsibility as manager of that particular position, which is a branch of one of the biggest businesses in the world.

Without telephone service b u s i n e s s would languish in a day and be practically at a standstill in a week. Public opinion would die of dry rot. It is the biggest constructive business in the world and comes nearer to the innermost interests of a greater number of men and women than any other institution. No private business, however widespread, touches so many lines so often. Did you ever stop to think that there is a telephone to every 7.2 persons in the United States?

It seems to me that next to the question of service, the question of good will is very important, particularly in the conduct of a public utility business.

That the importance of good will is recognized by the large corporations is evidenced by the fact that such concerns as Swift & Co., Armour & Co., the Bell telephone companies, and other large corporations are annually spending thousands of dollars in newspaper and magazine advertising in efforts to secure and retain the good will of the public.

An important part of our service and obligation to our employers is fostering such good will, and unless they have our co-operation to the end, the thousands of dollars spent for advertising are so many thousands thrown away. We are in a position to do more for them in this respect than all the advertising can possibly do—and the way to do it is by giving the public, our customers, the best possible service.

A Vacuum Tube Radio Receiving Set

Advantages of Vacuum Tube Receiving Set as Contrasted with the Crystal Detector Set—Parts of the Vacuum Tube Set and Their Purposes—The Various Types of Sets Described in the Southwestern Telephone News

By B. D. Hull

General Transmission and Protection Engineer, Southwestern Bell Telephone Co.

While there are exceptions to all rules, in general the crystal detector set is limited in its receiving range to a distance of probably not more than 20 or 25 miles, this distance of course, depending considerably upon the power output of the transmitting station. Sooner or later the radio fan with this type of set will want to reach out just a little farther and see what the fellow 100 miles or more away may be broadcasting. This article takes up the vacuum tube radio receiving set which greatly increases the receiving range.

In Fig. 1 is shown one of the simplest types of radio receiving circuit, using the vacuum tube as a detector. The action of the vacuum tube as a detector accomplishes the same purpose as the crystal detector.

Briefly, this piece of apparatus, which is playing such an important part in the communication field today, consists of a glass bulb evacuated to a high degree and containing three elements called the filament, grid, and plate.

The filament is made of metal coated with a special oxide and when heated by an electrical current, tends to give off very small electrical charges called negative electrons.

These electrons do not get far away from the filament and are constantly drawn back into it. But if the positive pole of a battery is connected to the plate, which is at some distance from the filament, the plate will attract these negative electrons, and there is then a stream of them passing from the filament to the plate and the space between them acts as a conductor. The current, however, goes only in one direction. The grid is placed between the plate and filament and is merely a wire screen.

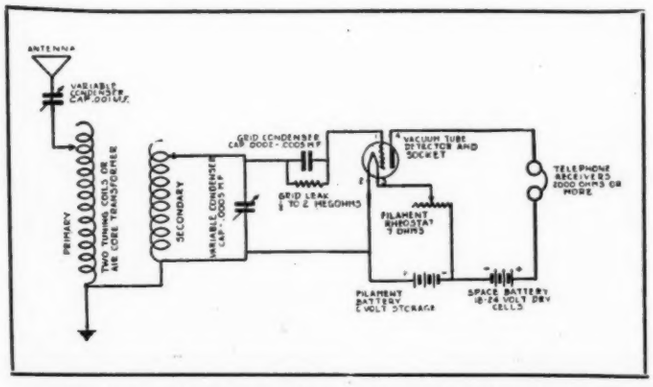

ANTENNA
VARIABLE CONDENSER CAP. .001 MF
PRIMARY
TWO TUNING COILS OR AIR CORE TRANSFORMER
SECONDARY
VARIABLE CONDENSER CAP. .0005 MF
GRID CONDENSER CAP. .0002 - .0005 MF
GRID LEAK 1/2 TO 2 MEGOHMS
VACUUM TUBE DETECTOR AND SOCKET
FILAMENT RHEOSTAT 7 OHMS
TELEPHONE RECEIVERS 2000 OHMS OR MORE
FILAMENT BATTERY 6 VOLT STORAGE
SPACE BATTERY 18-24 VOLT DRY CELLS

Fig. 1. Simple Type of Vacuum Tube Receiving Circuit.

If the grid is made positive, it attracts additional electrons from the filament which pass through the mesh and increase the plate current; if it is made negative, it repels the electrons and allows less to go to the plate. Thus it acts as a valve and controls the current between filament and plate.

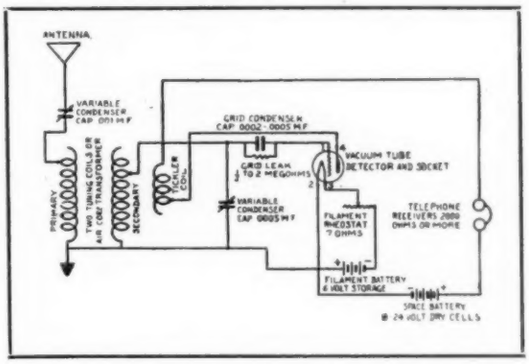
Incoming alternating currents, such as radio currents, when connected to the grid can thus control the current between filament and plate, and cause it to change in the same manner as the radio currents. The local plate current is supplied by a battery and is thus many times stronger than the radio currents, giving the effect of small currents controlling a large local source of energy. Then the tube acts as an amplifier.

In order to act as a detector, it is only necessary that the current between filament and plate change more in one direction than in the other. This is done by means of the grid condenser and the grid leak. These allow the grid to become only negative, and then changes in the plate current are caused only by the positive half of the incoming waves. This makes the current a direct pulsating one and allows the telephone receiver, through which the plate current flows, to respond to the incoming signals.

From a detector standpoint alone, the vacuum tube has probably very little advantage over the crystal. One of its greatest advantages is that it is more dependable. The vacuum tube, however, not only acts as a detector, but at the same time acts as an amplifier, so that the radio currents are not only detected but are amplified and this, of course, adds immensely to its effectiveness in a radio receiving set.

Referring to Fig. 1, the variable condenser in the antenna circuit is for tuning.

The wave lengths that can be received are limited by the range of the condenser and tuning coil. By connecting the condenser in parallel with the primary winding, tuning can be obtained for somewhat longer wave lengths. In order to tune for much longer wave lengths, inductance should be added in series with the antenna. These methods of shifting the condensers and adding inductance all find their use in commercial sets in tuning for the various wave lengths.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GRID LEAK 1/2 TO 2 MEGOHMS
VACUUM TUBE DETECTOR AND SOCKET
PRIMARY
TWO TUNING COILS OR AIR CORE TRANSFORMER
SECONDARY
VARIABLE CONDENSER CAP. .0005 MF
FILAMENT RHEOSTAT 7 OHMS
TELEPHONE RECEIVERS 2000 OHMS OR MORE
FILAMENT BATTERY 6 VOLT STORAGE
SPACE BATTERY 18-24 VOLT DRY CELLS

Fig. 2. Regenerative Receiving Circuit, Tickler Type.

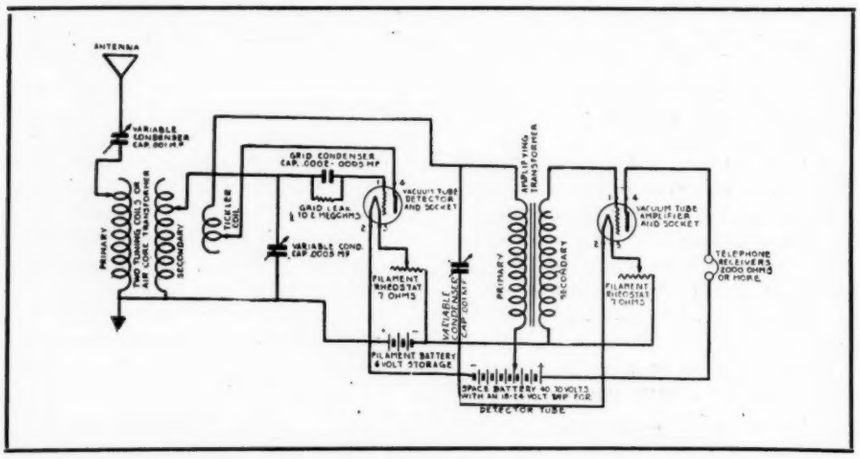
The variable condenser across the secondary is for tuning the secondary to the same wave length as the primary cicuit, just as in the crystal set. The A battery is for heating the filament. The proper amount of current required for the filament depends upon the type of tube used and can always be obtained from the manufacturer. The rheostat is for controlling this current.

A six-volt storage battery is best for supplying the current. Do not exceed the current rating as the amplification will increase very little, if at all, and the life of the tube is very materially shortened. Less current than the rated amount will somewhat affect the amplification, but this is not serious until the current is 10 or 15 per cent under the standard rating; and it is much better to underregulate than it is to over-regulate this current.

The B battery is for holding the plate at a potential which will cause it to attract the electrons flowing from the filament. No appreciable current, however, flows in this circuit, and dry cells are usually used. The voltage required depends upon the type of tube used, and can always be obtained from the manufacturer.

The grid condenser, briefly, is to hold a negative charge on the grid for a definite length of time, and the grid leak to allow it to leak off after a certain interval. The proper amount of capacity

and resistance in these two branches of the grid circuit also depend upon the tube and circuit being used, and can only be determined by test. Usually about 0.0001 to 0.0005 microfarad is used in the grid condenser, and from 0.5 to 2 megohms in the grid leak.


ANTENNA
VARIABLE CONDENSER CAP. 001 MF
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GRID LEAK 1 TO 2 MEGOHMS
VACUUM TUBE DETECTOR AND SOCKET
TICKLER COIL
VARIABLE COND CAP .0005 MF
FILAMENT RHEOSTAT 7 OHMS
VARIABLE CONDENSER CAP .001 MF
FILAMENT BATTERY 6 VOLT STORAGE
SPACE BATTERY 40 TO VOLTS WITH AN 18-24 VOLT TAP FOR DETECTOR TUBE
AMPLIFYING TRANSFORMER
PRIMARY
SECONDARY
VACUUM TUBE AMPLIFIER AND SOCKET
FILAMENT RHEOSTAT 7 OHMS
TELEPHONE RECEIVERS 2000 OHMS OR MORE

Fig. 3. Regenerative Circuit of Inductometer Type.

In Fig. 2 is shown a receiving circuit known as the regenerative circuit, tickler type. This is very similar to the circuit shown in Fig. 1, except that an additional coil is used, known as the tickler coil. With the home-made type of coils, this coil is set opposite to the primary or secondary.

The high frequency currents, after passing through the tube the first time, are amplified. This amplified current then passes through the tickler coil, and induces a current in the tuning coil which again passes through the tube, being amplified a second time.

This process is repeated and each time more energy is put through the receivers. The limit is reached when increasing the input of the tube no longer increases the output, and this limit is set by the constants of the tube. The increase in energy in each case is, of course, supplied by the B battery.

Only 30 turns are required for the tickler coil, bringing out the zero, second, fourth, sixth, eighth, tenth, 20th and 30th turns.

Another type of regenerative circuit is that known as the inductometer type in which the regenerative principle is accomplished by the use of variable inductance and the capacity of the tube. Fig. 3 shows such a circuit. This circuit is supposed to be slightly more efficient for the shorter wave lengths than the tickler type, but it is correspondingly more difficult to handle, is more sensitive, and I question whether it has decided advantages over the tickler type.

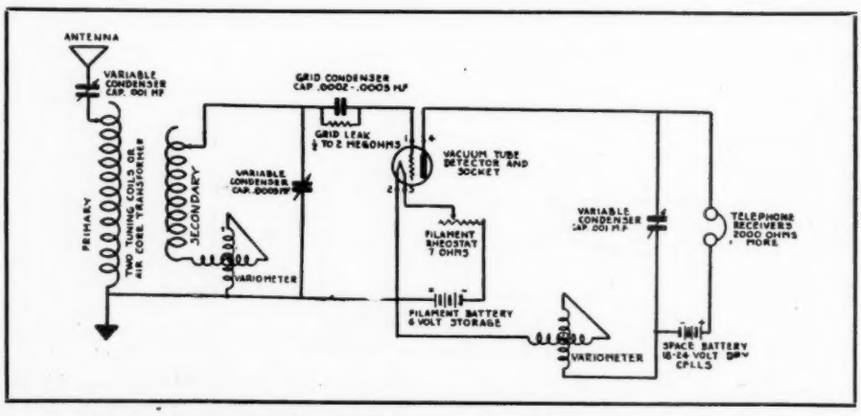
It is interesting to note that the majority of the regenerative type of receiving sets on the market today are of the tickler type.

Just for the same reason that you graduate from the crystal set to the vacuum tube set, so you go from the one tube set to the one-stage amplifier set. Fig. 4 shows this in the regenerative tickler type. The essential difference, it will be noted, is the addition of the second tube and the insertion of an amplifying transformer between the plate circuit or output of the first tube and the grid or input circuit of the second tube.

The best transformer to buy depends upon the tube used. To be ideal, the impedance of the primary should be approximately equal to the output impedance of the tube, and the impedance of the secondary should be several times that of the primary, say in the ratio of 10 to 1. Most manufacturers or supply dealers can tell you the ratio of turns but do not know the output impedance of the tubes. In this case it is well to purchase a transformer with about a 1 to 10 ratio of turns and take your chances on the primary impedance similating that of the tubes sufficiently well to give good results.

For loud-speaking receivers, an additional amplifying tube is usually necessary. This tube is wired in the circuit in a manner exactly similar to that of the first tube requiring only an additional amplifying transformer.

Just a word in conclusion. It is a very unusual case when success with a vacuum tube receiving set is met with in the first set-up or in the first few hours' effort with it. It is only by experience that the full possibilities of a vacuum tube set are learned, so that a word of caution is in order not to be discouraged if you have trouble at first in making the set work. There are so many things that play such an important factor in its success that it is only by considerable experience and a will to stick with it that you will finally win out.


ANTENNA
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VARIOMETER
FILAMENT RHEOSTAT 7 OHMS
FILAMENT BATTERY 6 VOLT STORAGE
VARIABLE CONDENSER CAP .001 M.F.
TELEPHONE RECEIVERS 2000 OHMS OR MORE
VARIOMETER
SPACE BATTERY 18-24 VOLT CELLS

Fig. 4. Single-Stage Amplifier Circuit of the Regenrative, Tickler Type.

Radio Bills to Come Before Congress in August.

It now seems probable that the congressional bills calling for an advisory body of 12 members, six of whom are to be appointed from the government, will be permitted to receive early consideration by Congress after the House reassembles in August.

The first problem will be the assignment of new wave lengths and whether to zone the country or classify the stations.

New Developments in British Telephone Service.

The British postoffice announced, on May 10, some details regarding the expenditure of 9½ million pounds upon the improvement and extension of the telephone service.

It is proposed to open 12 new exchanges at the following places in the London area: Monument (S. E.), Barnet, Tottenham, Eltham, Kilburn, Southall, Hounslow, Nunhead, Woodford, Wallington, Addiscombe, and Thornton Heath.

In the provinces, nine new exchanges are to be installed, namely, at Eastbourne, Southampton, Swansea, Birmingham, Sheffield, Buxton, Liverpool, Iverness, and Dundee.

Automatic systems are to be introduced into Gloucester, Swansea, Sheffield, Shrewsbury, Dundee, and Kirkcaldy, while new automatic exchanges are to be installed at Southampton and Fleetwood, where the system is already working.

Factors in Commercial Management

Operating a Telephone Plant for Profit and How It Allies With the Slogan "He Profits Best Who Serves Best"—With the Right Kind of Service and the Right Market, the Rest Is Easy—Paper Presented at the Texas Convention

By Sam H. Shutt

General Superintendent of Texas Long Distance Telephone Co.

The subject of commercial management is a very broad one, and might be considered as embracing practically everything that goes with the operation of a telephone plant. In this discussion of it, however, only those things that are vitally necessary in operating a telephone plant for a profit will be considered.

Every one who puts money into a telephone plant makes the investment with the expectation of profit and so the best method of judging whether or not a plant is being well managed is to ascertain if it is profitable. Now I do not mean by this that those plants that are not making lots of money are not being properly managed, for a great many conditions arise that are more or less temporary, and over which the manager cannot possibly have any control, that affect the net revenue of the plant materially. I mean just this: The telephone business, as an investment, is a sound proposition and with reasonably good management under ordinary conditions it can be expected to return a profit to those investing in it.

The slogan of the Rotary Club—"He profits most who serves best"—never was more applicable in regard to any business than to the telephone business. To sell our goods at a profit, we must have the right quality to sell.

No merchant ever built up a lasting business who did not have in mind the fact that he must give his customers the most value possible for their money. And so it is in the operation of a telephone exchange—we must give good service, first, last and all the time.

By good service it is not meant that every small exchange should have underground cable and common battery plants to enable it to give the service at a $1.50 rate which the city subscribers receive for a $4 or $5 rate. Every exchange has its own requirements, and its type of construction and equipment should be adapted to these requirements.

All of us are sufficiently well acquainted with the business to know what constitutes good service in the towns in which we operate. On the ordinary small plant it consists principally of keeping the lines and instruments working at a high state of efficiency all the time and that all calls be answered promptly and courteously.

The desire to please is the biggest factor in giving good service. If your lineman is anxious to please your customers, he will keep the wires tight so they will not get crossed up; will be quick to put in new batteries when he finds the ones in use are getting weak; will change a receiver cord promptly if he notices that your telephone has a cut-out; and will be just as prompt to fix the cords on the switchboard when the operator tells him they are cutting-out, for he will know the subscribers cannot be pleased with the service they will receive over bad cords.

DON'T BEMOAN A SLUMP—"GET GOING!"

Nowadays, when business is not all that it should be, there is a temptation to sit back and say, "Well, what's the use! We've done everything possible to stir up a little business and there is nothing doing, so what's the use of trying?" There is always a way. There was a way in and there is a way out. And success today comes to the man who grits his teeth, squares his jaw, and says, "There is a way for me, and, by jingo! I'll find it." The stagnator gathers green scum, finally dries up and leaves an unsightly hollow. — Clifford Sloan.

The same thing applies to your operating. If your operator is anxious to please and will let this desire be of service to the subscribers show in the intonation of her voice, in the promptness in which she answers the calls and puts them through, it will smooth the way for prompt collections.

Telephone service is an intimate, personal service and we must not try to get away from the personal part of it. Telephone operators are quite often called upon to do things that are entirely aside from telephone operating; some times on the small exchange it is a good policy to do this as it increases the value of the service to the subscriber.

Some of these things I have in mind are the giving of the time of day, morning calls, allowing subscribers to call by name instead of number, etc. Of course, sometimes we are asked to go to extremes in accommodating our subscribers like the woman who called the operator one day. She said she was going across the street for a few minutes and was going to leave the receiver down and would the operator please listen on the line, and if the baby waked up and started to cry to call her at Mrs. Brown's.

Such requests are exceptional and can be handled diplomatically when they come up. At other times, there are emergencies when the telephone operator has been able to be of great assistance to her subscribers, such as locating the doctor in case of sickness, or in case of fire or when the police are needed. I am glad to say that the telephone operator is always able to meet the emergency and do what is necessary when her help is needed along this line.

What has been said so far is more or less general and each manager has to work out his own problems as to how good he can make his service for the money he receives in rates.

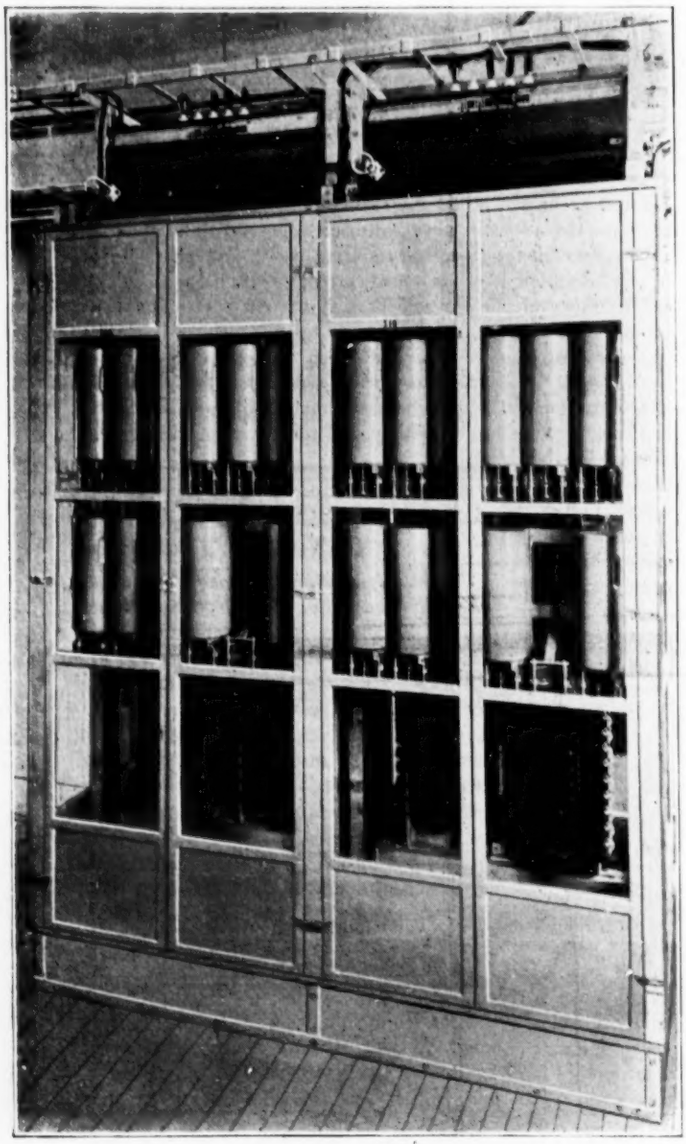
Assuming that the service is good, the next most important part of handling the exchange is the collecting. Of course, your collecting will depend upon your service, for collections cannot be good unless the service is good. But quite often the service is good and the collections are bad; this is simply a question of management in adopting and following out the right method of collecting.

Unquestionably the best method of collecting is to mail your bills out promptly to your subscribers on the first of each month, or quarter as the case might be, and put it up to them to come to your office and pay.

While the costs for stationery and for stamps might amount to something, after your bills are mailed out you are through with it except receipting for subscribers when they come in. You can then put in most of your time keeping up your plant, making new installations or soliciting new business.

It is unfortunate that so many managers are compelled to put in such a large part of their time in making collections. This time is a net loss and can be avoided by adopting the right methods and sticking to them. It takes nerve to make a change of this kind, if it has always been the policy on an exchange to present the bill to the subscriber, as there is always the chance of making some subscriber angry by mailing him a "dun," as some of them call it, but it is undoubtedly the best practice in the long run. I have found that most of those exchanges that I visit in Texas which are being operated profitably have some collection system of this kind.

In one exceptionally well managed ex-



Two Typical Connector Units

When considering the purchase of new central office equipment, remember that with Automatic the service is not only uniformly first class, but it costs less to give than the inferior service rendered by other types of equipment.

Strowger Automatic equipment can be fitted into your exchange at a cost easily within your reach. We have the proof. May we tell you about it in connection with your own needs? No obligation.

Ready to Serve Day and Night —Without Salaries

The connectors in a Strowger Automatic system perform all the various functions that an operator is called upon to perform in a manual system, and many others besides —and all of them with much greater accuracy and promptness.

Each group of one hundred lines has its own group of connectors. These are mounted on the rear side of the frame carrying the line switches of that group. The number in each group may vary from eight to twenty or more, depending upon the amount of traffic terminating in that particular group.

Strowger Automatic connectors, the "operators" of the Automatic system, may be relied upon at all times to render prompt, accurate and uniform service; regardless of traffic conditions, labor unrest, sickness, storms or any other factors that may slow up or otherwise hamper manual operation.

Automatic Electric Company

FACTORY AND GENERAL OFFICES: CHICAGO, ILLINOIS

BRANCH OFFICES:

New York City, 21 East 40th St.
Cleveland, 415 Cuyahoga Bldg.
Philadelphia, The Bourse Bldg.
Columbus, 518 Ferris Bldg.
Boston, 445 Tremont Bldg.
Rochester, Mercantile Bldg.
Detroit, 525 Ford Bldg.
Washington, 905 Munson Bldg.
Cincinnati, Union Central Bldg.
Los Angeles, 238 San Fernando Bldg.
Pittsburgh, 608 Fulton Bldg.
Kansas City, 1001 New York Life Bldg.

ASSOCIATED COMPANIES:
INTERNATIONAL TELEPHONE SALES AND ENGINEERING CORPORATION, New York
International Automatic Telephone Company, Ltd., London
Compagnie Francaise pour l'Exploitation des Procédés Thomson-Houston, Paris
Automatic Telephone Mfg. Co., Ltd., Liverpool
Automatic Telephones, Australasia, Ltd., Sydney

Dial operation of telephone systems is the only positive method of insuring first-class uniform service and an operating expense stabilized at a low point.

change, the manager, who is also the owner, sends out his bills to his town subscribers on the first of the month and they come in and pay monthly. To his rural subscribers he mails bills on the first of November of each year for the next year's rental—and all of his rural subscribers pay him annually in advance. He has a nice little exchange and is making money out of it because he is being paid for the service he furnishes.

When the bills are mailed out, it is necessary to keep stubs or copies of the bills in the office for reference when the subscriber comes in. When a subscriber fails to come in, he should be called over the telephone, say, about the 20th of the month, and reminded that he has forgotten the bill. This work of collecting is something that requires diplomacy and tact and must be backed up by good service.

Any method of collecting that is adopted should by all means be uniform, should apply to all subscribers alike. It will seriously hamper a manager in his work if it is found that he plays favorites, will let some bills run over longer than others, will call some subscribers about their bills and not call others. But if it is found that a manager treats all of his subscribers alike, insists kindly and courteously on prompt payment from all, they will have more respect for him and his business.

Practically all other public utilities require prompt payment, so why shouldn't the telephone company? All utilities, including the telephone company, have to make their investments in plant years ahead of the time that they actually collect for the use of it, so why should we not be entitled to collect promptly?

No one thinks of trying to ride on a train or interurban without paying in advance for that privilege, of sending a telegram or express package without prepaying it or guaranteeing its payment on delivery. The sooner all exchange owners get their collections on this basis, the better off they will be, for we must come to it some time.

In adopting any system of collecting, there should always be a definite time for discontinuing the services of all those subscribers who have not paid for their telephone service. Most of the larger companies that operate exchanges of all sizes, have adopted the method of mailing bills to the subscribers on the first day of the month and discontinuing the service on the last day if the bill has not been paid by that time.

Some have a rule of discontinuing service on the 20th day of the current month if the bill has not been paid by that time. Some have a reconnect charge of $1 if the telephone is disconnected for non-payment.

It is surprising how efficient some methods are. I know of one company operating several exchanges that always has a perfect collection record on some of its exchanges at the end of the month; some exchanges have been known to run for months at a time without having anything carried over at the end of the month. This is remarkably good work but such results cannot be secured in one month or even one year, for they are the result of a definite program carried out for a considerable period.

The next most important part of operating an exchange is the securing and maintaining of adequate rates. There are various ideas as to what it takes to make an adequate rate, but from different opinions handed down by courts on rate decisions, it seems to be the opinion of those best qualified to decide such matters, that an adequate rate is one that pays all expenses of operating and maintaining the telephone exchange, including a proper charge for depreciation, and allows the owner a reasonable return on his investment.

As to what rate of interest is a reasonable return, this is usually decided by what rate of interest is received on money invested in similar enterprises. As the telephone business is a hazardous one, subject to fires, sleet storms, and wind storms, being required at times to spend large amounts in moving poles on account of good roads, etc., the exchange owner is certainly entitled to a better rate of interest on his investment than if he had put his money into substantial bonds or similar propositions where there is no element of risk involved.

There have been a number of rate decisions handed down where it was decided that the telephone company was entitled to a rate of interest of at least 8 per cent on the value of the plant used in furnishing the service. Bear in mind that rates should be based on the value of the plant used and useful—not on your capital stock or what you might have invested in your exchange 10 or 20 years ago.

The wise telephone manager sets aside every month a fund for depreciation that will enable him to replace parts of his plant when they wear out or become obsolete. This depreciation charge is just as reasonable a charge as any other expense, and should be handled just as carefully.

To show just what I mean by a depreciation charge, suppose we take a plant that cost $10,000, including all poles, wires, switchboards, telephones, etc., bought new and installed. We will assume that the average life of all the parts that go to make up a telephone plant is 12 years, so we can reasonably expect this plant to be worn out in 12 years.

If 1/12th of the original investment of $10,000 is set aside each year during the life of the plant, when it is worn out you will have $10,000 to replace it. As a matter of fact, all the parts of a plant do not wear out at the same time, but it is necessary to make replacements of various poles, switchboards, etc., from time to time.

If you have this depreciation fund to take care of such replacements, you will not be handicapped by having large expenditures to be taken out of your earnings, and a consequent loss of profit during the period in which the replacements were made. Your investment will be more stable as it will pay regular dividends and you can easily attract new capital if it is needed for extensions.

Bear in mind that practically all courts deciding such matters have held that a depreciation charge is right and should be made, for it is only fair to the public that they can be assured that the telephone plant which furnishes them service is going to be maintained at a normal state of efficiency by parts of the plant being replaced as they wear out, without there having to be a big increase in rates to enable the telephone company to buy a new switchboard or something else in order for them to continue to furnish service.

The rates on most of the larger exchanges in Texas are regulated by such bodies as city councils and commissioners. The smaller exchange, however, is left to itself to charge whatever rate is found to be reasonable and fair.

There are always two extremes possible in rates. One exchange may have rates that are very low and while the manager does a good business, he cannot fill the demand for telephones. His collections may be good, yet, being handicapped by the low rates, he may not be making anything in operating the plant and possibly losing money. On the other hand, exchange rates might be too high, higher than the people of the community can afford to or will pay.

There may be some who have to have a telephone but there are not enough to allow the manager to make anything from operating, for his overhead expense is just as high for a few subscribers as it would be for several more.

Between these two extremes, a rate can be found that is fair to the subscriber, will allow the telephone company to make a reasonable return on its investment, allow for depreciation so that the service can be maintained, and still not so high that the rates will hinder the development of the system in the community which it serves.

We must always bear in mind, in establishing rates, that we owe it to ourselves and to our subscribers to handle the tele-

BE FRIENDLY.

If you will adopt the plan of making a better friend of everybody you deal with, you won't have to think anything about whether you are courteous or not. Your heart will tell you what to do.—Henry L. Doherty.

phone plants as economically and efficiently as possible. No community should be compelled to pay high rates just so the telephone company can make a profit, for the reason that the manager does not know how to handle a telephone plant.

Another important factor in securing and maintaining satisfactory rates is the good will of the people of the town in which the exchange is located. Patrons will usually pay a little more for good service than for service that is only fair.

Another thing the manager should do is to make himself, his employes and his company a part of the town. Let the people of the town realize that the telephone company is just as much a part of the town as any other of its institutions. Let them feel as much at home in the telephone office as in Bill Smith's grocery.

Of course, you have to have operating rules, etc., that will insure a uniform, satisfactory service, but when one of your customers comes into your office he should be met with the same cheerful greeting that he would get in the dry goods store. Then if your customer is your friend, he is ready to listen to you when you have to explain to him why you are compelled to raise your rates.

We, who operate local telephone exchanges, owe it to our subscribers to so manage our plants that we are not likely to have to close up if some sudden calamity were to occur, such as a fire or heavy damage suit.

Insurance should always be carried on the exchange equipment so that if a fire should occur funds will be available for at least part of the purchase price of the new equipment. It is hardly worth while to carry fire insurance on anything but the central office equipment as the other parts of the plant are so scattered that much damage is unlikely to occur at any one place.

And then there is always the prospect of a damage suit to contend with on account of personal injury to employes or the public. The employes' liability insurance that all companies employing over three persons are required to take eliminates the possibility of trouble from that source.

Public liability and property damage insurance will prevent the probability of a very heavy loss from accident to persons or property caused by the telephone plant. Prevention of loss of funds on account of dishonesty of employes can be guarded against by having each employe bonded. This does not cost very much and should be done where employes handle money belonging to the company. It is customary among all the larger companies.

In addition to the different kinds of insurance mentioned, there is also what is called a use-and-occupancy insurance, by which you are indemnified in case of loss of revenue from your plant from fire or other source. This is simply insurance against loss in revenue. There are also burglar, holdup and tornado insurance to be considered where it is thought the expense would be justified. The average small exchange is doing fairly well if it provides against the loss of central office equipment by fire, and takes care of its employes by carrying employes' liability insurance.

This discussion would be very incomplete if I failed to mention the importance of some accurate method of keeping books or accounting. I believe that any man is very foolish to run any kind of a business, regardless of how small it is, if only a peanut stand, without having some means of knowing what he is making or losing at the business.

The Interstate Commerce Commission prescribes proper methods of accounting for all classes of telephone companies, and the larger companies are finding the methods prescribed to be fairly satisfactory and I believe the smaller ones will find them adapted to their requirements.

If you are not already keeping an accurate set of books, let me suggest that you arrange to begin it at once. There are a number of accountants in the state who make a specialty of telephone accounting and can assist you in opening up a set of books at comparatively small cost.

This discussion might be carried on indefinitely as there are a great many things entering into the proper operation of a telephone exchange, such as proper routine for handling orders, reporting and clearing of trouble, advertising, contributions to various enterprises, employes' welfare, etc. But allow me to say in conclusion that the most important thing is service. When you have the right kind of service to sell and have a market for it, the rest of it is easy.

THE NEW TENANT—FAITH

By Miss Anne Barnes,

Traveling Chief Operator, Iowa Independent Telephone Association, Des Moines, Iowa

Frequently I hear people complain of hard luck. Perhaps the hard luck has not become a fact, but there is a fear and a worry that it will at a not very distant time.

Worrying about that which has not yet happened is giving oneself undue anxiety. Perhaps the thing will not happen after all. Most assuredly it will be more likely to happen if a person puts herself in a state of mind which unfits her for the proper performance of her work. As soon as anyone is occupied with trying to do her work as well as she can she has no time to worry.

I met a woman recently who has been a telephone operator for about ten years. Her thought is that after ten years of continued service it is time to break down, as "what nerves can stand such constant strain and not reach the breaking point?"

She has fed her mind with this kind of food for about three years; the result is that she has never qualified for the vacancies in positions higher up. But the sad part of it is this: She believes others have been favored—that she has not been given a chance to see what she could have done.

As a matter of fact, she has been given to considering herself, her own life and her own petty affairs too closely. How I wanted to tell her—but I did not know her very well—that even *now* if she would smile more she would get the habit and thus *smile* instead of *frown* at the petty happenings around her.

If she would believe in the best instead of the worst about people with whom she came in contact, most people would be *immensely* fine in her estimation. If she would oust from her mind a tenant known as *self*, she could fill that mind with industrious thoughts and thoughts helpful for others. If I help her with these words, even though I never see her again, I shall be glad.

In this great old state of Iowa, she has only to look out of her window and view nature 100 per cent fruitful. Nature bends to the elements but never bends to self elements; for this reason Nature is 100 per cent.

As she looks out I hope she will memorize these lines and believe in them:

The little cares that fretted me, I lost them yesterday
Among the fields above the sea, among the winds at play;
Among the lowing of the herds, the rustling of the trees;
Among the singing of the birds, the humming of the bees.

The foolish fears of what might chance, I threw them all away
Among the clover-scented grass, the new mown hay,
Among the husking of the corn, where drowsy poppies nod,
Where ill thoughts die and good are born—
Out in the field with God.

Illinois District Meet at Savanna

Good Attendance and Fine Weather Make District Meeting Big Success—Constructive Policies Outlined by Speakers—Combined with Open Meeting of Savanna Commerce Association—Event Given Wide Publicity by Newspapers

The weather was never so fine and the Mississippi River never so beautiful as on June 20 and 21 when the June district meeting of the Illinois Telephone Association was held at the old river town, Savanna. This meeting was combined with an open meeting with the Savanna Commerce Association in the Masonic Hall on the evening of June 20, at which an address was delivered by John F. Gilchrist, vice-president of the Commonwealth Edison Co., Chicago.

Mr. Gilchrist chose for his subject the physical expansion of public utility properties, the conservative character of their business, and their rapid growth. He pointed out the very interesting fact that the cost of telephone service, for instance, although amounting to large sums of money in certain large commercial establishments such as his own company, the Commonwealth Edison Co., of Chicago, represented in reality a very small percentage of the total paid for salaries.

The company of which he is vice-president expends $200,000 per year for telephone service. "That seemed like a large sum," said Mr. Gilchrist, "until I analyzed it and found our payroll was approximately $10,000,000 per year. Then I realized that it amounted to but 2 per cent of the amount we are expending for wages, and certainly the telephone as a labor-saver earned more than that for the company.

"I convinced myself that if we were spending 3 per cent for telephones, we would be just that much better off, for every telephone call represents time and steps and energy saved of valuable employes."

In discussing the development of public utility service, Mr. Gilchrist emphasized the fact that the great farming communities will ultimately be extensive purchasers of electric light and power.

"The great farming districts of the country will eventually have power," said he, "but I would warn those who are seeking it to proceed on a sound basis. It would be lamentable if farm electric development took the same course as did farm telephone service. Such service would be of little or no benefit to the farmer or his wife. There should be the most serious study of the problem which is one of the most vital and interesting which the country has to solve today."

The open meeting of the Savanna Commerce Association which Mr. Gilchrist addressed was presided over by the mayor of Savanna and was attended by the business interests of the city.

On Wednesday, June 21, the delegates and operators became the guests of E. R. Allen, general manager of the Carroll County Independent Telephone Co. The session of the executives was held in the ballroom of the Masonic Hall, with Dr. R. E. Gordon, of El Paso, president of the Illinois Telephone Association,, on account of the delayed arrival of the officers of the Northern Illinois district association, in the chair.

Addresses were delivered by Dr. Gordon and Jay G. Mitchell, secretary-treasurer of the Illinois Telephone Association. In an adjoining room the sessions of the operators' traffic conference were conducted by W. S. Vivian, of Chicago, assisted by L. F. Kline, of Clinton.

Visiting delegates and operators were entertained as guests of Mr. Allen, general manager of the Carroll County Independent Telephone Co., at a luncheon served by the ladies of the Baptist Church at which the Rotary Club of Savanna appeared in a body. A most enjoyable time was had by those present. Addresses were delivered by Dr. Gordon and F. J. Stransky, of Savanna. Judge Stransky's address was rich with constructive suggestions to utility executives and an analysis of the conditions under which public utilities are operating in this state.

At the afternoon session of the executives' conference, Harry B. Crandell, of Springfield, outlined the methods and practices of the Illinois State Tax Commission. A general discussion of the problem confronting telephone companies having pole lines along bond-issue state roads, as well as those having pole lines which must be removed on account of the construction of hard roads, followed.

Louis Pitcher, of Dixon, and George X. Cannon, of Freeport, respectively, president and secretary of the district association, delivered addresses on the development of radiotelephony which had the merit of being based on actual experience and successful operation of radio equipment.

Group of Progressive Telephone Folks Taken in Savanna, Ill., in Front of the Up-to-Date Home of the Carroll County Independent Telephone Co. Which Acted as Host.

There were 97 guests at the luncheon, and it was the universal opinion of those present that the meeting was a constructive and valuable one.

Mr. Allen, of the Carroll County company, prepared items telling about the meeting which were published in the newspapers of the communities near Savanna and also in the local papers, so that the public was fully aware of the gathering.

The Savanna Commerce Association was also interested in the meeting by Mr. Allen several weeks in advance and took action to aid in the entertainment of the the telephone people.

Commissions, Courts and Councils

Discussion and Rulings of State Bodies Having Supervision Over Telephone Companies—Decisions of Courts in Matters of Interest to Public Utilities and Actions of City Councils Relative to Franchise, Rates and Service

Dismiss Complaint Against Northwestern Bell—Deny Raise.

On July 6 the South Dakota Railroad Commission dismissed the complaint of C. J. Morris as to various rates of the Northwestern Bell Telephone Co. in Sioux Falls and denied the application of the company for an increase in exchange rates in that city.

The charges for service connection, listing name in directory and in boldface type, and private branch exchange service were found to be fair.

The reasonableness of the rates for business and residence service was gone into at length when the commission took up the application of the company for an advance.

The application for the increase was filed at the hearing and the company supported it with considerable testimony. Neither the officials representing the city of Sioux Falls nor the subscribers of the company were notified that the question of higher rates would be brought up, so no evidence was offered by them.

Prior to the hearing R. Miller, engineer, and L. R. Bitney, statistician for the commission, spent three weeks in making an investigation of the company's records. The commission disapproved of the method by which the company arrived at the reproduction cost new. Regarding this, the commission said, "We do not believe that reproductive cost now based upon abnormal prices brought about by the world war is a proper basis for valuation for the purpose of fixing a rate, although we are of the opinion that the additions and betterments made during this period should be considered."

While allowing $3,500 for going value at the Sioux Falls exchange, the opinion stated that if the company had, since the commencement of operations at Sioux Falls, received sufficient revenue to pay all expenses connected with the operations of the property, including a reasonable sum of depreciation and a fair return, the company would be entitled to no allowance for this item.

Figures brought out at the hearing showed that the number of subscriber stations has increased from 3,191 in 1912 to 7,959 in 1921.

The commission fixed the fair value of the Sioux Falls exchange property at $685,000, the cost on the company's books being $680,319.

The items of licensee revenue, depreciation of plant and equipment, and assignment of system and division supervision should be modified, according to the commission.

Regarding licensee revenue, it was stated: "This commission is satisfied that the 4½ per cent agreement with the American Telephone & Telegraph Co. results in a payment in excess of the value of the facilities and services rendered, and that the basis for payment is fundamentally wrong."

As a result of the average rental increase of 43 per cent by the postmaster general, main line business rates were advanced from $3.00 to $4.50 a month at the Sioux Falls exchange. Under the terms of the 4½ per cent agreement, the A. T. & T. Co. would receive an increase of 81 cents a year, or an increase of 50 per cent on each main line business instrument installed.

The Missouri commission decision, which allowed 45 per cent of the amount claimed under the 4½ per cent contract and which was upheld by the state supreme court, was cited. The case of the city of Buffalo, N. Y., against the New York Telephone Co. was also mentioned, in which the commission disapproved the 4½ per cent of gross revenue payment and in the absence of sufficient proof reduced the allowance to 75 cents an instrument.

The South Dakota commission stated that under the Missouri plan the amount of licensee revenue for Sioux Falls would be reduced from $8,640 to $3,888, a decrease of $4,752. Under the New York allowance the reduction would amount to $2,670.

"In the absence of more definite information," said the commission, "we are of the opinion that fair allowance for the service and equipment furnished would be an amount sufficient to cover the cost of maintenance, depreciation and return on investment, based upon the value of the equipment in use, and that in this case $4,735 is a reasonable amount to allow for this purpose."

A rate of 4 per cent for depreciation was felt to be fair, which would reduce the charge for 1921 by $5,062.

Discussing supervision, the commission said: "The testimony shows that labor expended by the defendant company in maintenance work during 1921 was loaded or increased 21 per cent to 32 per cent each month and construction 48 per cent to 108 per cent to cover engineering expense, plant supervision, tool and general expense. . . . The percentage of supervision assigned construction work is excessive. There is a reasonable limit to the value of supervision that may be assigned to construction work and this limit is exceeded when an assignment of from 48 per cent to 108 per cent is added to labor costs.

"Owing to the labor situation during the war period, it is possible that a larger than ordinary amount of supervision was necessary. This condition is now past and it is expected that the company will find a means of reducing the cost of supervision.

"As stated in the testimony, it is possible that a supervision cost of this proportion may be necessary in connection with the operation of toll plant and exchanges located in larger centers. So far as this particular plant and other property owned in this state is concerned, we believe and find that the percentages added to labor costs to cover supervision are unreasonable and not justified."

Speaking of the operating expenses, the commission said, "It is a matter of common knowledge that conditions are getting back to a more normal basis and for that and other reasons a greater amount of work is being done by a smaller number of employes."

All things considered, the commission felt that the company should be able to operate under the present rates.

"SERVICE."

Service is the greatest thing in the human calendar, and the better we equip ourselves the better we serve, because in the expansion of the mind comes the better understanding of how best to serve. Let me tell you, young men and young women, no matter what your fortunes in life, the greatest compensation that will come to you tomorrow or next year or the closing year of your life will be the consciousness that you have somehow been of service, either to your friends, your state or your common country. This is the greatest thing that can happen.—President Warren G. Harding.

Indiana Bell Says Long Distance Expense Eats Up Revenue.

Establishment of a state-wide long distance toll rate schedule was requested by F. O. Cuppy, secretary of the Indiana Telephone Association, testifying at the hearing on the petition of the Indiana Bell Telephone Co. for an increase of long distance rates. The hearing was held before the Indiana Public Service Commission in Indianapolis on June 26.

Thomas R. Keyes, auditor for the In-

diana Bell, testified that his company's proposed advance of rates was intended to give $314,828 of additional revenue from long distance patrons.

Cities represented at the hearing were South Bend, Mishawaka, Kokomo, Princeton, Vincennes, Crawfordsville, Shelbyville and Mount Vernon.

Arthur A. Clarke of Vincennes, asked a postponement of the hearing, asserting that the objectors were without sufficient information as to the Bell company's proposal. The commission decided the company should present its case with the facts, the objectors to have an opportunity to present evidence at the July 10 hearing.

Mr. Keyes stated that for the 12 months ended last April 30, the company received a total long distance revenue of $955,045, and expended $850,206 for the service during that time. The earning, he said, was 1.7 per cent on an investment of $6,148,788, the tentative estimated valuation that the commission had placed on the long distance properties.

Counsel for the company analyzed the company's position to mean that 38 per cent of the long distance messages would not be affected by the proposed higher rates; that 28 per cent would be advanced about five cents a call; and the remainder less than 5 cents.

The company has 91 exchanges and 171,000 stations over the state.

Fix Higher Rates for Service in Council Grove, Kan.

The Council Grove Mutual Telephone Co., of Council Grove, Kan., was given authority on June 22 by the Kansas Public Utilities Commission to establish the following schedule of monthly rates:

Business	$2.25
Residence	1.25
Rural	1.25
Business extension	1.00
Residence extension	.50
Desk sets	.25

Higher Rates—Same for Stockholder and Non-Stockholder.

The Philadelphia Farmers Telephone Co., of Philadelphia, Ind., has been authorized to charge a rate of $1.50 to all subscribers with 25 cents off to those owning their own instruments, as a result of an order issued recently by the Indiana Public Service Commission. The company has also been ordered to cease the practice of giving free service either to subscribers or stockholders.

The evidence brought out that some of the stockholders have not been paying their assessments the last two or three years and are still receiving service. Inasmuch as the company has not been putting aside any amount for depreciation or receiving any revenue from the money invested, it was obviously in need of additional revenue in order to maintain the plant.

The former rates were held by the commission to be discriminatory as the non-stockholding patrons were paying a much lower rate than those who hold stock. The new rate is to apply to both classes.

It was also ordered that the stockholders not paying the assessments be immediately disconnected. Regarding these persons the commission said:

"The laws of the state of Indiana prohibit free service being given to anyone, and any subscriber or stockholder who receives service year after year without any payment stands as one receiving free service and violates the law."

Kansas City Company Gets Raise in Five Kansas Towns.

A raise in the charges for service in five Kansas towns was allowed the Kansas City Telephone Co. by the public utilities commission on June 24. Overland Park, Shawnee and Merriam, in Johnson County, and Bethal and Vance, in Wyandotte County, are the towns affected.

The new rates per month are shown below:

Business:	
One-party	$ 4.50
Four-party	2.75
Residence:	
One-party	2.25
Four-party	1.75
Rural:	
Ten-party business	2.50
*Ten-party residence	2.00
Desk sets	.25

*Rate for Bethel and Vance $1.50

Burleson Rate Governs Division of Tolls in Kansas.

Under ruling of the Kansas Public Utilities Commission, dated June 17, the Salemsburg Farmers' Telephone Co. lost its action to have the United Telephone Co. of Abilene, restore toll service at Salina and Lindborg at a charge of five cents.

Prior to February 21, 1921, the toll rate between these exchanges was five cents a call, which was divided evenly between the companies. In conformity with the rule of the postmaster general known as the Burleson rate, issued February 21, 1919, the United company put into effect a toll charge of ten cents. Although the rule applied equally to the Salemsburg exchange, the Salemsburg company declined to use that rate and continued to charge five cents.

The commission has now ordered the Salemsburg Farmers Telephone Co. to pay to the United Telephone Co. five cents for every toll call which originates on its exchange and is transmitted to the exchange of the United Telephone Co. at Salina or at Lindsborg and which is completed at either of those places. The United company is ordered to pay the same amount for calls originating at its exchanges and terminating at the Salemsburg exchange.

Injunction Against Louisiana Commission Under Advisement.

Arguments on the Cumberland Telephone & Telegraph Co. injunction suit and the Louisiana Public Service Commission motion to dismiss were completed before Judges Rufus E. Foster, Nathan R. Bryan and Henry D. Clayton in the United States district court at New Orleans.

The court announced that some time will lapse before a decision can be made, it being necessary for the three judges to render a joint opinion on the temporary injunction sought by the Cumberland Bell on June 23. Judge Foster will decide the dismissal motion sought by the commission.

A mass of documentary evidence, affidavits, exhibits and briefs was filed by the company and the commission. These were submitted to prove the actual investment, depreciation and operating expenses claimed by both sides, which conflict and and through which the basis of rate-fixing is disputed.

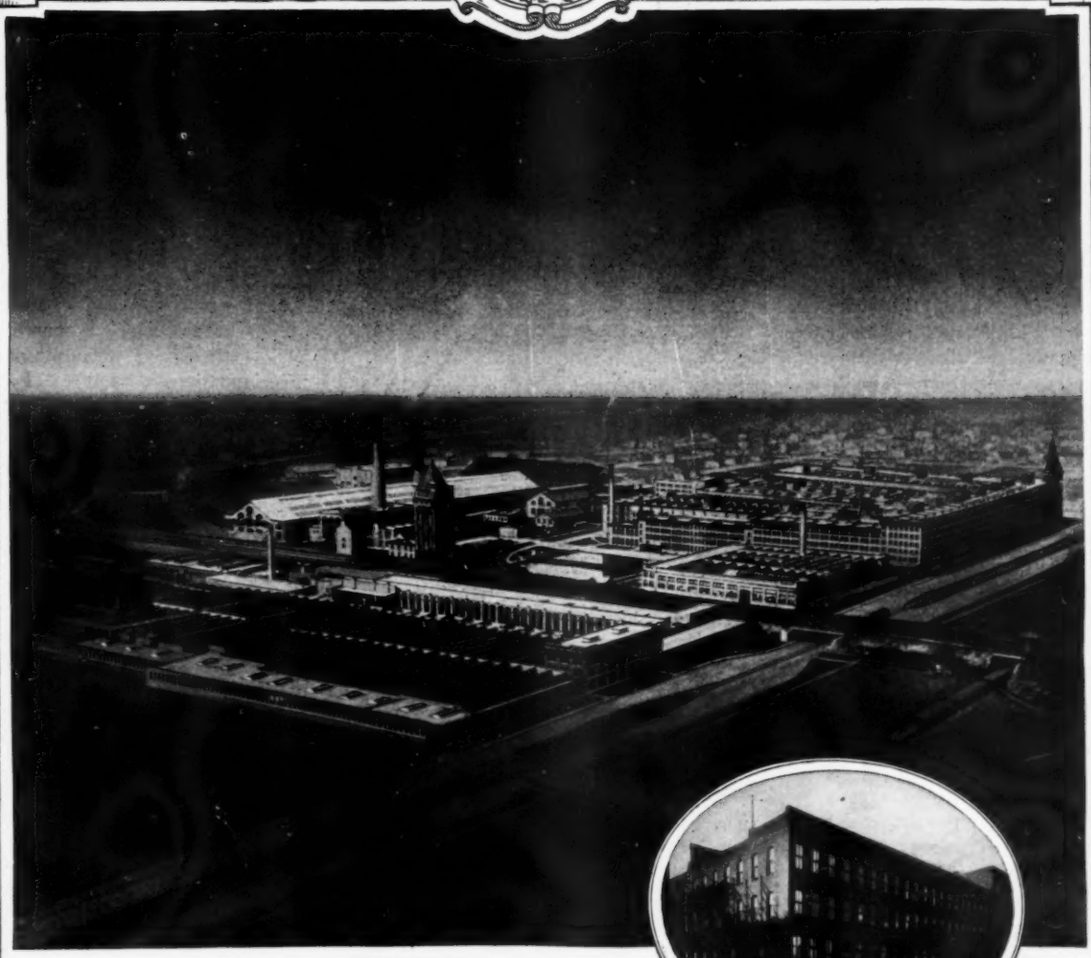
Whether the case had reached the judicial stage, and therefore, properly could be presented to the court proved to be an important issue. J. Blanc Monroe and James C. Henriques, telephone company attorneys, contended that the judicial stage had been reached because the fixing of the rates by the commission on February 26, 1921, was a legislative action. They contended that this fixing was complete and the new rate effective.

Both sides maintained that their efforts in the case were to maintain a status quo, the telephone company claiming that it desired by means of a temporary injunction to keep the rates approved by the order of February 26, 1921, in force until the merits of the case could be argued in court.

Attorneys for the commission declared that the status quo they were upholding was that in existence May 13, 1922, when the commission suspended the increased rates pending a rehearing in New Orleans, June 27.

The statement of George J. Yundt and J. M. B. Hoxsey, vice-presidents of the Cumberland Bell, upon whose testimony the company is claiming a property valuation in Louisiana of $15,000,000, were questioned by A. H. Roberts, former governor of Tennessee, associate counsel for the commission, and Huey P. Long, chairman of the commission. They took the view that as neither of these officials resides in Louisiana their statements of valuation are worthless.

The classification of revenue into interstate and intrastate rates, a classification that the commission attorneys insisted is required in all other states where the Cumberland operates, brought charges from Mr. Monroe that a division of this kind never before had been asked. He further stated that inasmuch as the com-



The Western Electric telephone plant at Chicago today

The whole manufacturing plant in 1877
(two upper floors only)

Where your Bell telephone came from

It is forty-five years since a handful of men began making history and telephones on the top floor of the modest building at the right.

Today a plant which covers 200 acres and employs 38,000 people is needed to meet the demands of your telephone service.

The Western Electric works at Chicago now produces more than 2500 telephones a day, against a dozen a day in 1877. This increasing responsibility, moreover, has brought with it a need for more and more accurate equipment, which this Company has been able to supply only because of its constant touch with the problem.

The history of Western Electric is a record of experience in making telephones unique among electrical manufacturers.

Western Electric

Since 1869 Makers of Electrical Equipment

mission never notified them to prepare this, their failure to do so could not be ascribed to a desire to withhold necessary information for arriving at a basis on which to establish rate increases.

A history of the case dating back to the 1918 rate increases authorized by Postmaster General Burleson while the telephone company was in government control was given by J. C. Henriques for the telephone company and by Mr. Long for the commission.

The telephone company attorneys in their brief claimed that Commissioner Francis Williams, prior to his election announced publicly to the voters that if he were elected he would reduce telephone rates. They contend he circularized every voter in his district with postal cards, copies of which were submitted in the exhibits, to this effect, and that he made no reservations in his promise or pledge.

Unified Service in Saginaw, Mich., Home of Valley Company.

The physical consolidation of the Michigan State Telephone Co. and the Valley Home Telephone Co. in Saginaw, Mich., was effected June 24.

When Acting Mayor George Holcomb closed the switch, workmen who had been waiting for this signal started their tasks and within an hour had practically completed the joining of the two systems. Only the smoothing out of details remain to complete the merger which resulted from the purchase of the Valley Home company by the Michigan Bell a few months ago.

Telephone Booths Ordered for Railroad Telegraphers.

The Nebraska State Railway Commission ordered the Burlington Railroad and the Western Union Telegraph Co. to put in telephone booths at all of the stations on the Imperial branch. The two companies then quarreled over which should pay the cost, had the case reopened, and a lot of testimony introduced. The companies could not agree which should pay the cost, and the telegraph company insisted the booths were not necessary as operators could use a code in telephoning.

The case is an odd one. The railroad company has no telegraph line along the branch and uses the telephone to operate its trains. If any person desires to send a telegram, this is telephoned by the operator to McCook, on the main line of the Burlington, where the Western Union takes it.

The opportunity to get an earful of what other people's business was proved too much for the town gossips, and they took to hanging around the stations when the agent was on duty so that they might hear the contents of the telegrams of neighbors that he telephoned to McCook. The senders of the telegrams finally demanded secrecy, and the order to install soundproof booths followed a hearing.

Refuses to Accept Commission's Consolidation Order.

Eben D. Warner, who holds a controlling interest in the Platte Valley and Wehn Telephone companies, has notified the Nebraska State Railway Commission that he will not accept the terms of the recent order of that body following his application for a consolidation of the two properties, which are located in contiguous territory. Mr. Warner says that the principal reason he desired the two companies operated as one was that he might secure economy in the operation and record keeping.

The application was granted by the commission, but it put in so many safeguards, as it called them, to protect the subscribers of the Platte Valley from the possibility of having to carry the Wehn company, that Mr. Warner finds it impossible to proceed with his plans.

The Platte Valley is a prosperous concern, but the other company, due to the advance construction Mr. Warner and his associates have done in anticipation of future development, does not have rates at this time to carry its investment. For that reason the commission hedged the consolidation about as closely as it did.

Mr. Warner had planned for a complete refinancing of the Platte Valley, which now carries a considerable bond issue. By the consolidation it would have been possible to convert the outstanding notes into stock, and this would have formed a sound basis for a larger bond issue that a trust company had already agreed to take. The country served is a developing one, but so new that the community has not accumulated reserve capital that could be interested in a telephone proposition.

Mr. Warner has been one of the large Independent operators in the state for a number of years. He and E. M. Leflang built the North Platte city property and sold it to the Bell. Later he purchased and greatly developed the Wyoming & Northeastern company, which he also sold to the Bell. He is now confronted with the task of supplying a newly-opened territory of promise in the Goshen Hole country by adding to his investment in the Platte Valley.

Dismisses Petition Asking Reduction of Rates.

The Nebraska State Railway Commission has dismissed the application of G. C. Barry for an order reducing the rates of the Citizens' Telephone Co., of Malmo, of which E. C. Hunt is the owner. The commission finds no merit in the complaint.

Mr. Barry originally wanted to have the rates to farmers reduced from $1.50 a month to $1.00 a month, but when confronted by the fact that this would reduce the revenues $5,000 a month, he amended it to have the rate fixed at $1.25. He said that telephone rates ought to follow the general price decline.

At the hearing only one other subscriber of the company, aside from Barry, appeared to back him up, and he eventually said that if he could get better service he would be willing that rates should remain as they are. It developed that his complaint was based on inability to get Central at times other than the hours at which the exchange was regularly open. They complained that because farmers were charged $1.50 a month, a rate of $1.25 to two-party town subscribers was a discrimination.

The commission finds that this rate is not a discrimination, that the differential is the one usually employed in exchanges in the state and constitutes a fair and reasonable schedule. The exchange serves 825 subscribers, three-fourths of them farmers, and the commission finds that to make any reduction whatever would bring rates and revenues to less than they were before the war.

The company made but $664.13 on an investment of $42,000 during the year 1921, the commission finds, when an 8 per cent return entitled it to nearly five times that sum. Operators are now paid $65 a month, where a little over $40 was the rule before the war, and the commission can see no possibility of any reduction in operating expenses. As there seemed to be no widespread dissatisfaction with service, the commission entered an order of dismissal.

Says Western Electric Dividend Not Earned From A. T. & T.

The July 7 hearing on the relations between the New York Telephone Co. and the Western Electric Co. was held in Albany before Commissioner Charles G. Blakeslee, of the New York Public Service Commission.

Edward V. Cox, supply contract auditor of the American Telephone & Telegraph Co., was cross examined by Deputy Attorney General Wilber F. Chambers.

Mr. Cox stated that the total stock issue of the Western Electric Co. was 350,000 shares of no par value and that about 98 per cent of these shares was owned by the A. T. & T. Co. Based on a par value of $100 a share, the witness said the company would be worth about $35,000,000, although the shares are carried on the books of the company at about $38,000,000.

"These shares each earned about $10 a share in 1921," said the witness, "and are worth much more than an assumed par value of $100 a share."

"And did the Western Electric Co.

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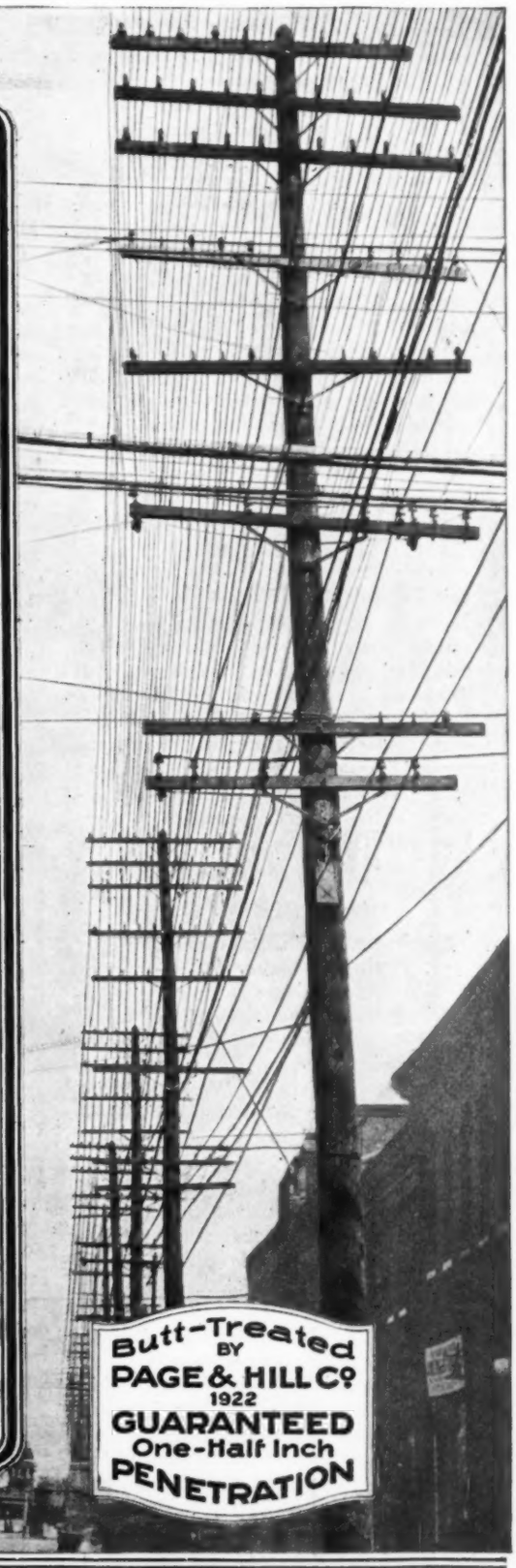

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earn this $10 a share on the various percentages paid it by the New York Telephone Co. and the associated companies of the American Telephone & Telegraph Co.?" inquired Mr. Chambers.

"No sir," replied the witness. "As a matter of fact practically all of the money earned by the Western company was from outside business; that is, business firms outside of the telephone and associated companies. The Western company sells to the telephone and associated companies nearly on a cost basis."

He further asserted that although there had been a downward trend in supply materials since the war, the cost has started upward again. This upward trend, he said, applied to practically everything used by the telephone company.

Special Master in New York Telephone Suit.

Judge Mayer of the United States Circuit Court in New York City on July 3 appointed James G. Graham, a lawyer, a special master to take testimony in the litigation instituted by the New York Telephone Co. to restrain the New York Public Service Commission from attempting to enforce the order to reduce the company's rates.

The commission is now temporarily enjoined and an appeal is pending. Mr. Graham will begin taking testimony October 16, when it is expected the appeal will be decided.

Telephone Call Cost Him $50 For Trying to Save 25 Cents.

A 25-cent telephone call cost G. R. Tuttle $50 in Orange County, N. Y.

Tuttle, according to officials of the Port Jervis Telephone Co., asked for a toll call in Port Jervis to Warwick. When told to deposit a quarter, he is alleged to have inserted a metal slug in the slot instead.

He was indicted, charged with violating the penal code and defrauding the company. County Judge Russell Wiggins rebuked Tuttle and ordered him to pay $50 fine.

Columbus, Ohio, to Get Single Service in Three Years.

Unification of the Ohio Bell and Ohio State telephone service in Columbus will not take place for three years. Dates were announced recently by officers of the Ohio Bell Telephone Co. for several mergers.

In Columbus the Ohio State is operating under a franchise which expires in 1925, when it is expected to merge.

At Dayton the union is set for January 1, 1923. June 1, 1922, had been set as the date at Findlay, but delay was caused because of a controversy over the rates, it was said.

Franchise complications brought about a delay at Springfield where it was proposed to effect consolidation July 1.

August 1, 1923, is the date decided upon for Cleveland.

Consolidation will be conditioned upon higher rates for which the company expects to ask probably in September.

Unification has already been completed in 11 Ohio cities.

Hearings Begun in Dayton on Ohio Bell Request for Advance.

The hearing in Dayton, Ohio, on the petition of the Ohio Bell Telephone Co. for a schedule of advanced rates in that city, was opened by George T. Poor, chairman, F. B. Maullar and C. C. Marshall, of the Ohio Public Utilities Commission, June 26.

Karl E. Burr and C. S. Maltby, of Columbus, and E. E. Burkhardt, of Dayton, represented the company. Mr. Burr, in his statement to the commission, stressed the fact that $700,000 of the company's money was spent annually in Dayton and that the Ohio Bell was as much a part of Dayton as any other of its commercial plants.

Attorney Burr also told the commissioners that up to the present time, no dividends had been paid on the common stock of the company, and that from present indications, none would be paid during the balance of the year. After unification of the two telephone systems, which will mean a total investment of $6,524,422, at the present telephone rates, the company would be unable to maintain a prosperous condition, financially, he said.

In its statement to the commission, the Indiana Bell claimed that the total value of its buildings in Dayton is $368,658 and the value of its land $231,689.

The first session was consumed by qualifying B. G. Danis as an expert witness on building values.

Must Give Adequate Service Despite Financial Conditions.

Public utilities are not relieved from obligations to give adequate service because of the lack of financial ability, the Pennsylvania Public Service Commission declared in directing the Liberty & Roaring Branch Telephone Co. to repair its lines. The order was entered June 24.

Companies in such a predicament, according to the commission's order, must find ways to perform public duties or give way to some other company or means whereby the service to which the public is entitled may be provided.

The company was also directed to submit a detailed statement of the repairs it will undertake to perform.

Common Stock Is Authorized for Plant Additions.

The Wisconsin Railroad Commission on June 27 gave authority to the Glidden Telephone Co., of Glidden, to issue $6,000 of its common stock and $50,000 of its bonds.

The common stock and $14,000 of bonds are to be used for the purpose of acquiring the Mellen telephone exchange; and $36,000 of the bonds are to be used for the purpose of securing funds with which to pay outstanding indebtedness and to pay for future additions and extensions to the property and plant of the company, and all for purposes properly chargeable to capital account.

The commission found the value of the Mellen telephone exchange property to be $20,000.

Allows 25 Cent Increase—Suggests Depreciation Reserve.

While not approving the fact that the $1.25 net rate proposed by the Tamarack Telephone Co., of Arcadia, Wis., applies to all class of service alike, the railroad commission found that for no class was it excessive and accordingly allowed the increase. The previous charge was $1.00 per month.

As the company had not set up the depreciation reserve suggested in 1917 when the $1.00 rate was granted, the commission advised that $3,000 be transferred from the surplus account to the depreciation account.

The Tamarack company serves 328 subscribers, of whom 218 are rural. All lines are of grounded construction.

Gets Raise but Must Disconnect 15-Day Delinquents.

In granting the Farmers Mutual Telephone Co., of Baraboo, Wis., an advance of 20 cents a month for each of its three classes of service, the Wisconsin Railroad Commission, on June 20, specified a disconnection rule to which the company must strictly adhere.

This was done because the financial difficulty of the company was found due not so much to inadequate rates as to the fact that collections have not been made promptly and a large amount of revenue will have to be written off as bad accounts.

The disconnection rule provides that subscribers failing to pay the gross bill within 15 days after expiration of the discount period shall be disconnected and shall be reconnected only upon payment of a $2 fee if the reconnection is made within a year.

The Farmers Mutual Telephone Co. is a roadway company owing 30 rural circuits serving 413 subscribers connected to the switchboard of the Wisconsin Telephone Co. at Baraboo. It also owns 7 rural circuits serving 84 subscribers who are connected to the Wisconsin company switchboard at North Freedom. The lines are practically all grounded and, according to service complaints, a great deal of trouble has been experienced on some of the circuits with electrical induction from transmission lines.

You've probably used or seen National One Hand Locking Cable Rings—you know how they grip the messenger and how durable and strong they are.

Now comes National Junior made in small sizes —1½ and 2 inches—that, like National rings, the harder the pull the tighter the grip.

National Junior grips the messenger with two prongs and with both prongs in place the spring in the ring forms a tension that grips the messenger in a clamp-like grip that positively will not slip.

They are easy to put on and positively will stay put. The two prongs are set apart wide enough so that National Junior is especially desirable for reclipping.

National Juniors are now available in quantities. Send for descriptive literature and price lists.

The National Telephone Supply Co.
5100 Superior Ave. Cleveland, Ohio

National Junior

The Ring With the Tension Grip

The net rate for subscribers connected to the North Freedom exchange and securing service to both North Freedom and Baraboo was raised from $1.20 to $1.40. Those connected to Baraboo exchange and securing service to that place only must pay $1.75 instead of $1.55, while those connected to Baraboo and securing service to both Baraboo and North Freedom were raised from $1.60 to $1.80, all effective July 1.

The commission retains jurisdiction in the case so that the rates may be reduced without further hearing if the service department of the commission reports that service conditions have not been made satisfactory within 60 days.

Authorize Common Stock to Establish Equality with Property.

On June 30, the Wisconsin Railroad Commission authorized the Viroqua Telephone Co., of Viroqua to issue 200 shares of its common stock of the par value of $100 per share, making a total issue of $20,000.

This stock is to be distributed equally, share for share, among the holders of the stock of the corporation now outstanding, in order to bring the total of the outstanding stock, bonds, notes, and other evidences of indebtedness more nearly to an equality with the value of its property. The commission found that the value of the property of the company was at least the sum of $30,000.

Not Liable Because of Neglect to Answer Fire Call.

Where a city fire department is under no legal duty to respond to a fire call, a telephone company is not liable for damages from a subscriber's fire loss for negligently failing to answer a fire call.

In an action against a telephone company for negligently failing to answer a fire call, allegations that if defendant had promptly answered the call and made connection with the fire department, the fire department would have answered the call and saved the property, were not allegations of fact and were not susceptible of legal proof. Forgey vs. Macon Telephone Co.; Supreme Court of Missouri; 237, Southwestern 792.

Summary of Commission Rulings and Schedule of Hearings.

ILLINOIS.

June 27: Galesburg Union Telephone Co. directed to prepare and present a detailed inventory of its physical property.

July 11: Hearing held at Chicago on citation to Illinois Bell Telephone Co. to show cause why rates for service in Chicago and adjacent territory should not be reduced.

July 11: Hearing held at Chicago in matter of application of Illinois Bell Telephone Co. for advance in rates for service in Galena. Petition also filed to place in effect emergency rates pending investigation and final determination.

July 12: Hearing held at Chicago on petition of Streator Telephone Co., of Streator, for rate advance in Streator and Grand Ridge. Continued from June 27 for cross-examination on motion for order granting temporary relief.

July 12: Hearing held at Chicago in matter of proposed advance in rates of Belvidere Telephone Co., of Belvidere.

July 12: Hearing at Chicago in matter of increased rate schedule filed by Prophetstown Mutual Telephone Co., of Prophetstown. Complaint filed by Rock River Mutual Telephone Co. against switching charges being increased by Prophetstown company, and hearing as to that portion of case to be continued to a later date.

July 13: Hearing at Chicago in matter of advanced rates requested by De Kalb County Telephone Co., of Sycamore, for service in DeKalb and other towns.

INDIANA.

June 26: Hearing held at Indianapolis on petition of Indiana Bell Telephone Co. for an increase in long distance toll rates, evidence of company taken at this hearing. Continued to July 10 to give objectors opportunity to present testimony.

July 5: Hearing held in Fort Wayne on application of Nine Mile Telephone Co., operating in Allen county, for an increase in rates. Matter taken under advisement.

July 6: Smithville Telephone Co., of Smithville, recently organized, granted authority to issue and sell $5,000 of its common and $5,000 of its 15-year, 7 per cent preferred stock, both having a par value of $50 a share.

July 6: Philadelphia Farmers Telephone Co., of Philadelphia, authorized to charge $1.50 to all subscribers owning their own instruments and to discontinue giving free service.

July 7: North Manchester Telephone Co., of North Manchester, permitted to set certain poles in Chester township.

July 11: State-wide conference called in Indianapolis for this date relative to proposed rules and principles to be laid down by commission for the placing of electric current wires.

KANSAS.

June 17: Salemsburg Farmers Telephone Co., of Salemsburg, ordered to pay United Telephone Co., of Abilene, five cents for every toll call originating on its exchange and transmitted to the exchange of the other company at Salina or at Lindsborg. United company also required to pay the same sum for calls originating at its Salina or Lindsborg exchange and terminating at the Salemsburg company's exchange.

June 22: Council Grove Mutual Telephone Co., of Council Grove, authorized to advance rates.

June 24: Kansas City Telephone Co. permitted to increase rates in Overland Park, Shawnee and Merriam, in Johnson county, and in Bethel and Vance, in Wyandotte county.

June 27: Authority given Rush Center Telephone Co., of Rush Center, to increase its rate for independent line business telephone from $1.25 to $2.00 a month.

June 27: Permission to establish schedule of increased rates given Roxbury Telephone Co., of Roxbury. The new rates are: Business, one-party, $2.00; party-line, $1.50; residence, one-party, $1.50; party-line, $1.00; Rural, party-line, $1.25; switching, 60 cents.

June 29: S. R. Doutart and J. E. Blakesley, partners, doing business as the Virgil Independent Telephone Co., of Virgil, given permission to sell their telephone plant and property to Emporia Telephone Co., of Emporia.

June 29: Lane Telephone Co., of Lane, allowed to increase its rural switching rate from 35 cents to 60 cents a month.

June 29: Application of Danville Rural Telephone Co., of Danville, to establish a rate of 66⅔ cents a month for rural switching allowed.

June 30: Hearing on application of Cherryvale Telephone Co., of Cherryvale, for a new schedule of rates continued to 90 days from this date.

LOUISIANA.

June 28: Hearing on rates of Cumberland Telephone & Telegraph Co. in Louisiana postponed pending decision of United States district court on application of Cumberland Bell for an interlocutory injunction against the commission.

NEBRASKA.

July 3: In the application of the Lincoln Telephone & Telegraph Co. for permission to close exchange at Strang and give subscribers thereto service from Geneva exchange; commission finds company cannot be compelled to give service to a community which will not pay rates sufficient to maintain it, and gives it the option of keeping exchange open or giving service from Geneva.

July 3: Complaint filed by H. Bradley, manager of the Wauneta Telephone Co., that he is unable to prevent W. A. Holderby, delinquent subscriber, from retaining service connections.

July 5: Notification filed by Platte Valley Telephone Co. that it will not accept the consolidation order of the commission with the Wehn company.

July 5: Complaint filed by V. H. Bartlett that Lincoln Telephone & Telegraph Co. will not furnish him service within Lincoln city limits unless upon payment of $110 bonus, cost of extending line to his residence.

July 6: In the matter of the application of the Leigh Telephone Co. for validation of a 60-cent monthly rate for extension telephones; it appearing that this has been in vogue for years and was presumed by the directors to be a proper rate, and not being out of line with the charge usually made for such service; ordered that it be validated.

July 6: Complaint and application of G. C. Barry for reduction in rates of Citizens' Telephone Co., of Malmo, dismissed for want of sufficient evidence supporting demand.

NEW YORK.

July 7: Hearing held in Albany on state-wide affairs of New York Telephone Co. Adjourned to July 10.

July 10: Hearing at Albany on petition of New York Telephone Co. for increased rates in New York City.

OHIO.

June 26: Hearing held in Dayton on application of Ohio Bell Telephone Co. for increased rates in that city.

SOUTH DAKOTA.

July 6: Complaint of C. J. Morris against Northwestern Bell Telephone Co. regarding various rates at Sioux Falls, dismissed. Application of Northwestern Bell for increased rates at that exchange denied.

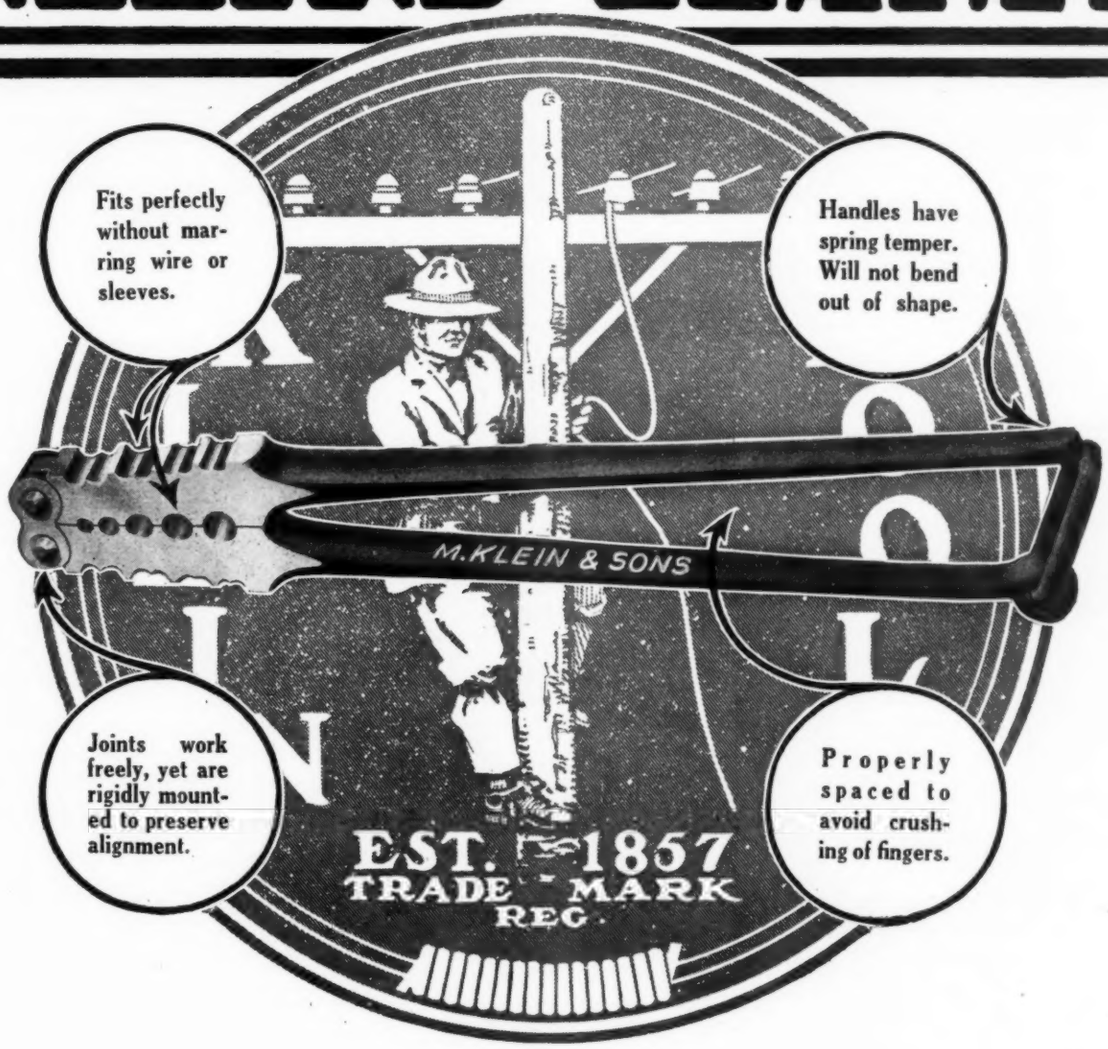
WISCONSIN.

June 30: Authority given Prairie Farm, Ridgeland & Dallas Co-Operative Telephone Co., of Prairie Farm, to increase rates from $13 to $14 a year.

June 30: Michigan State Telephone Co. permitted to increase rates at Niagara and Florence exchanges.

July 6: Milton & Milton Junction Telephone Co., of Milton Junction, ordered to extend service to Harry Fraedrich.

KLEINS CLAMPS


Fits perfectly without marring wire or sleeves.
Handles have spring temper. Will not bend out of shape.
M.KLEIN & SONS
Joints work freely, yet are rigidly mounted to preserve alignment.
Properly spaced to avoid crushing of fingers.
EST. 1857
TRADE MARK
REG.

The First Splicing Clamp Was a Klein Splicing Clamp!

It is a fact that the Klein Splicing Clamp is the ancestor of all splicing clamps. 67 years of experience in making linemen's tools still keeps it the first.

The old-timers know that specially designed joints permit a Klein Splicing Clamp to work freely, without loss of alignment — that the handles are properly spaced to avoid crushing of fingers—and that the dies are snugly fit to gage and will not injure the wire or sleeves when twisted.

Equip your outside gangs with the best! Buy Klein Splicing Clamps!

Mathias KLEIN & Sons

Established 1857 — Chicago, Ill. U.S.A.

From Factory and Salesroom

Modern Heating, Soldering and Brazing Appliances.

One of the problems constantly before the telephone, telegraph and electrical industries is that of finding efficient, economical and convenient means of performing heating, soldering and brazing operations on wiring, cables, motors, generators and hundreds of other operations requiring the application of heat in one form or another. The recent development and improvement of appliances for this class of work, by a prominent manufacturer of acetylene tanks, is of interest.

These torches are unique in that they require no preheating, pumping up, generating, or other preparation. To operate them, it is merely necessary to turn on the gas and light. The flame is said to be considerably hotter than can be obtained with either gasoline, alcohol or city gas, and makes for much faster work. It can be regulated by turning the tank valve to suit individual requirements and preferences.

The work that can be done covers the entire range of heating and soldering operations which may be necessary in telephone, telegraph and electrical work, from soldering the finest wire to heating melting pots, paraffine pots, or wiping cable joints and splices.

For soldering small wire joints, terminals, etc., the type A torch, which furnishes a small concentrated flame, is used. An astonishingly short length of time is required to complete the operation, and the finished joints, it is declared, cannot be improved upon. There is sufficient heat—and it is applied just at the point where it is needed.

An outfit suitable for this type of work consists of a tank 13 in. long by 4 in. in diameter, which contains ten cubic feet of gas, sufficient to operate the torch ten hours, a regulating valve which provides automatic control of the gas flow, a length of rubber tubing, and the torch. This outfit is easily carried. The torch itself weighs only two or three ounces, and the weight of the entire outfit approximates 12 pounds so that it can be fastened to a man's back with straps, or even with a length of twisted pair wire.

An interesting demonstration of this particular equipment was made on the job, before a prominent New York electrical contractor. The wire splices on one of

The Prest-O Soldering Iron.

the floors of the new building were made with an alcohol blowtorch. One electrician and two helpers took 1 1-2 days to complete soldering all the splices on the floor, while on the next floor practically the same number of joints were completed in one-half day by one helper and a Prest-O torch. This performance under actual working conditions with the torch in the hands of a man who was unfamiliar with it speaks for itself.

The torch can be operated in a high wind with marked success, and its advantage becomes particularly apparent when it is subjected to adverse cold and windy weather conditions.

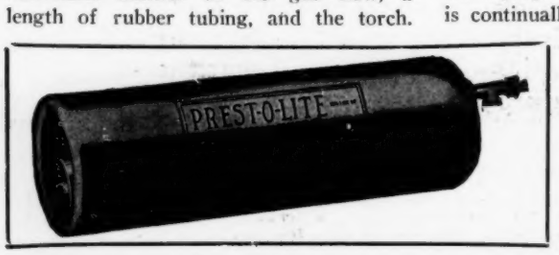
The Prest-O soldering iron is used to advantage for soldering splices on cable work, particularly toll cables where a joint of practically laboratory perfection is essential. The joint is soldered without injury to paper insulation. The iron is continually at a correct soldering temperature thus insuring uniformity and eliminating the common trouble which results from a man using ordinary soldering irons when they are too cold to insure a true-soldered joint.

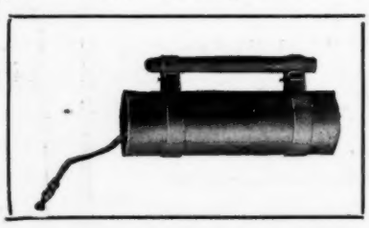
The outfit is identical with the one previously mentioned, except that the torch is replaced by the soldering iron. The appearance and weight of the iron coincides very closely with the conventional soldering iron, and it can be handled by anyone who has done soldering without having to learn, or unlearn, anything except that work may be done continuously, instead of waiting for irons to heat up. This soldering iron consumes slightly less gas than the torch and will operate about ten hours from the MC tank.

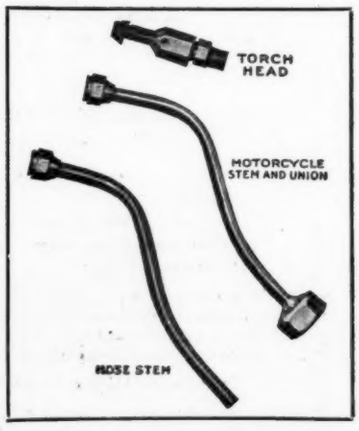
A larger torch consuming from five to six cubic feet of gas per hour, is generally used for heavier work, such as melting, soldering cable terminals and lugs, and is invaluable to electrical workers. The diameter of the torch-head is ¾-inch at its largest part and the torch is furnished with handles 12 inches and 18 inches long, providing accessibility to confined spaces where it is absolutely impossible to get with other apparatus.

It makes construction and repairs on power switchboards a matter of ordinary accomplishment, and changes the viewpoint of men that such are difficult jobs to be shunned and avoided as much as possible. The small torch-head is also furnished fitted with a thread for these handles so that either the small of large flame can be used to advantage.

It is stated that one of the important recent developments is that a brazed joint on open wire, copper or galvanized iron is not only many times stronger than a sleeve, soldered sleeve, or ordinary soldered joint, but resistance is reduced 90 per cent.







The Type B Tank—Type A Prest-O Torch Attached Directly to the M C Tank—Type A Torch and Connection Parts.

These torches are highly efficient for brazing and have the advantage of being a one-man outfit and easily portable. A tank 20 inches long by 6 inches in diameter, weighing 30 pounds, will run the

"INDIANA"

TELEPHONE AND TELEGRAPH WIRE

PROVEN BEST BY TEST

Time and the aid of America's foremost engineers, have enabled us to develop and manufacture the highest grade wire known to the trade. It is greatest in conductivity and lasting qualities, due to the superior quality of material from which it is made, as well as its *Extra Double Galvanizing,* which insures longest life.

STEEL STRAND

Single and Double Galvanized, Standard, Siemens-Martin, High Strength and Extra High Strength Grades.

HANDLED BY MOST JOBBERS

MANUFACTURED BY

INDIANA STEEL & WIRE CO.

MUNCIE, INDIANA

CONDENSERS

Mansbridge Type Condensers are Self-Sealing and cannot be internally short-circuited. If one is broken down by a lightning or high-tension discharge, or by mechanical damage, it automatically and instantaneously seals up, this being the unique and characteristic property of the metallized paper.

You can drive a pin right through a Mansbridge Condenser and the capacity and insulation will still be O. K.! Sounds impossible, but it's solid fact!

Complete Satisfaction

That's the reason why the Mansbridge Condenser has made good.

Mansbridge Condensers are **More Reliable, Lighter, Smaller and no more Costly** than those of the old fashioned solid foil type.

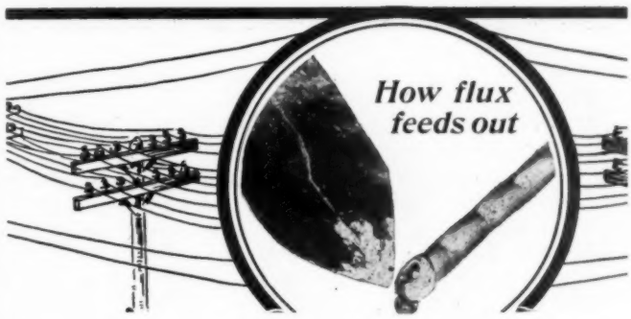
They are made under license by Western Electric Company, Ericsson Mfg. Co., Electric Specialty Co., Stromberg-Carlson Co., American Electric Co., and by numerous other licensees all over the world.

Insist upon having MANSBRIDGE CONDENSERS.

For full particulars and for terms of manufacturing license in U. S. A. and Canada apply:

G.F. MANSBRIDGE

Mount House, New Barnet, England



More than a solder —a method of soldering

THE best of tools will not cut production costs unless the method of using is right. Kester *Acid-Core* Wire Solder not only does soldering more economically, but it does it ***better*** and ***quicker*** for it is the modern method of soldering.

With Kester Solder you need only to apply heat in any form and the job is completed in a twinkling—far neater and cleaner than the old time method.

Kester is a hollow wire solder full of tiny pockets that hold a scientifically prepared acid. As the heat is applied these pockets release the flux ***right to where it is needed*** and in this way eliminate the use of a separate messy, uncertain and unnecessary flux.

This feature cuts soldering time in half and in addition produces neater, cleaner and more substantial work.

The coupon below brings a sample that will make your toughest job easy and simple.

KESTER

Acid Core WIRE SOLDER

Manufactured by the

CHICAGO SOLDER CO.

Direct Factory Representatives

The Faucette-Huston Co. - - Chattanooga, Tenn.
Louis J. Ziesel Co., 216 Market St. - San Francisco

Free Trial Coupon

CHICAGO SOLDER COMPANY Tel. 7-15-22
4211 Wrightwood Ave., Chicago.

Gentlemen: Please send me a free sample of Kester Acid-Core Wire Solder.

Name .....

Company .....

Address .....

City ..... State .....

Our Supply House Is .....

large torch eight hours and the small torch or soldering iron 40 hours.

With these torches, brazing is no more difficult than soldering. The appliances take up little room in the tool bag. The type MC tank, 13 inches long by 4 inches in diameter and weighing ten pounds can be carried in the tool bag. The type B tank 20 inches long by 6 inches in diameter can be conveniently carried in a car, truck or motorcycle. It can be handled by one man with ease, even to the extent of carrying it up a pole or pulling it up with a handline and hooking it on to a cross arm, cable strand or platform.

The tanks used to supply gas for operating these torches are the same that are employed on thousands of automobile trucks and motorcycles for lighting.

These same tanks may also be fitted with lights and utilized for night trouble—shooting and night construction work. The brilliant floodlight satisfactorily illuminates a large area and can also be concentrated where it is most necessary.

Four sizes of tanks are supplied as follows:

	Contents cu. ft.	Dimensions in inches	Weight in lbs.
Type A	70	22x7¼	45
Type B	40	20x6	30
Type E	30	16x6	25
Type MC	10	13x4	10

Initial tanks are sold outright after which exchanges may be obtained by paying for the gas only. Tanks are maintained by the Prest-O-Lite Co., and the tank owner does not bear any part of the cost of maintenance so long as the tanks receive reasonable care and are not maltreated.

The initial cost of the torches is small and with reasonable care their cost of maintenance is negligible.

A most comprehensive system of distribution, comprising 30 charging plants, 300 distributors and 22,000 dealers, covers the entire country and full tanks may readily be obtained anywhere. Complete details may be obtained from the Prest-O-Lite Co., Inc., Small Tank Dept., 30 E. 42nd St., New York.

New Kellogg Operator's Head-Band Receiver.

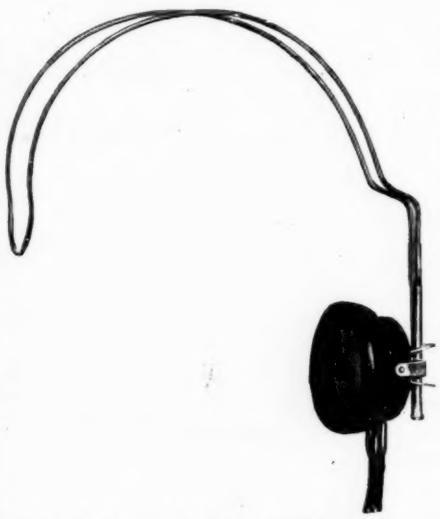
The Kellogg new head receiver, No. 54A, has now been in actual service for nearly a year, and the Kellogg company advises that it is receiving letters almost daily mentioning the fine service, reliability and consequent great popularity of this Kellogg light-weight head receiver over the standard type Kellogg receiver which has been in successful use for so many years.

Managers express their liking for this set voluntarily, because their operators are unanimous in expression of delight at having so vastly improved a headset to wear.

It weighs 2¾ ounces as compared to six ounces in the old standard type. The head band of Kellogg enameled steel wire is correspondingly lighter than old style head bands.

The transmission efficiency of this Kellogg operator's receiver is high. All terminals are entirely enclosed within the shell which is non-metallic.

The cap is of the most approved design and screws into place with heavy threads,



New Kellogg 54-A Light-weight Receiver.

the diameter of this cap being 2 3/16 inches. The diameter of the shell itself is 1¾ inches, total depth one inch. The cord terminals are secured in standard fashion of our regular receiver shells with a convenient tie cord arrangement. The head band is instantly removable.

Reports Great Interest in American-Made Goods.

B. L. Moore, vice-president of the Federal Telephone & Telegraph Co., has just returned from a 14 months' trip in foreign countries in the interests of his company.

Mr. Moore reports a great interest in American-made goods in all countries he visited, and says the name "Buffalo, N. Y., U. S. A." is becoming well known to the four corners of the earth in the distribution of Federal radio and telephone equipments.

Society of Automatic Telephone Engineers Holds Meeting.

A meeting of the Society of Automatic Telephone Engineers, a professional body recently organized by the engineers of the Automatic Electric Co., Chicago, was held Thursday evening, June 15. An enjoyable supper was served before the meeting, which was attended by about 70 members and associates.

T. G. Martin, chief engineer of the Automatic Electric Co., gave a most interesting talk on the pioneer period of the automatic telephone industry, sketching the gradual development of the Strowger system and outlining a few of the many difficult problems which were continually arising during that stormy period of the company's career.

Ralph W. Engsberg presented a paper on "Automatic Equipment in the Sydney, Australia, Network," which precipitated a lively discussion of the keyboard calling device and other features peculiar to the Sydney network.

The question box was handled by E. R. Neir, factory manager, who courageously undertook to render impromptu answers to any and all technical questions.

President F. R. Quayle announced that no regular meetings will be held during July and August. The next meeting will be held sometime in September, the date to be announced later.

More Bell Exchanges Converted to Automatic Operation.

Three more exchanges in the Bell system have recently been equipped with Strowger automatic switchboards.

On June 10, one of the offices of the five-office network operated by the New England Telephone & Telegraph Co., at Hartford, Conn., was converted to automatic. The new automatic exchange has installed capacity of 4,700 lines.

On May 28, a 3,000-line Strowger automatic switchboard was cut into service at St. Joseph, Mo., by the Southwestern Bell Telephone Co. This exchange is part of the three-office network of that city.

A few weeks previous, the exchange at Columbia, S. C., serving 3,500 lines, was alos converted to automatic by the Southern Bell Telephone & Telegraph Co.

Other exchanges in the Bell system which are scheduled for conversion to automatic during the coming months include Little Rock, Ark.; Peoria, Ill.; Topeka, Kans.; Syracuse, N. Y., and Scranton, Pa.

Esthonia Contemplating Much-Needed Telephone System.

The telephone system of Esthonia, inherited from the Russian regime, is so antiquated that extensive betterments are becoming imperative, according to George G. Fuller, U. S. Vice-Consul at Reval. Except the private lines of the Soviet mission which connect with Petrograd, the only connection with other countries is the submarine cable to Helsingfors. Toll lines throughout the country are so scarce that long distance calls are seldom made.

At present, central office equipment is old Russian, cables are German, connecting wires Swedish, and instruments and miscellaneous equipment are from the Esthonian factory in Dorpat. The few underground cables are not laid in conduits, and the cost of locating and repairing is so great that concrete conduits must be laid.

Not only is line construction contemplated, but an entirely new central plant

Exide
BATTERIES

The fundamental value of Exide Batteries in the telephone field has been proven ever since the central energy system was established over 25 years ago. Today, the Exide is as modern in construction and design as the latest practical innovation in telephony; a fact attested by its almost universal use.

THE ELECTRIC STORAGE BATTERY CO.
Oldest and largest manufacturers in the world of storage batteries for every purpose
1888 PHILADELPHIA 1922
Branches in 17 Cities
Exide Batteries of Canada, Limited, 133-157 Dufferin St., Toronto, Canada

Note Protection at Corners

Blake Insulated Staples

Unequalled for telephone and bell wiring. The fibre insulation prevents troublesome short circuits and grounds.

4 Sizes Pat. Nov. 1900

Write for Samples

Blake Signal & Mfg. Co.
BOSTON, MASS.

DIAMOND EXPANSION BOLT Co
90 West St. ◇ New York
MANUFACTURERS

Expansion Bolts Drills
Screw Anchors Toggle Bolts
Cable Clamps Bridle Rings
Duct Rods Guy Clamps

GALVANIZING
PLANT - GARWOOD, N. J.

DISTRIBUTORS
Western Electric Company
INCORPORATED

SERVICE GOVERNS RATES

The Lima Telephone and Telegraph Company secured an increase in rates in 1921 from the Ohio Public Utilities Commission mainly because of the superior service rendered by them.

> In its findings the Commission stated: "The Commission would be most reluctant to grant any increase at this time in view of present day conditions were it not for the fact that testimony adduced at the hearings and the admission of counsel for the city conclusively discloses that *the service of the Lima Company is equal to, if not the most efficient and satisfactory of any telephone company in this country.*"

The Lima Company was enabled to give this service by installing the North Automanual Exchange System.

What the Automanual has done to better service and decrease operating costs in Lima and other cities it can do for you.

For full particulars as to North Automanual, Dial Automatic, or Satellite (remote control) Systems, write for Bulletin No. 1.

THE NORTH ELECTRIC MANUFACTURING CO.
GALION, OHIO

must be installed. The number of subscribers could be tripled at once if equipment were adequate. However, installation is being planned to take care of the growth for some time in the future, and a switchboard of 25,000 lines is under discussion.

The chief engineer is now making an investigation in Germany, Belgium, and Sweden, to determine whether a manual, automatic, or semi-automatic board will be purchased, as well as other modern equipment.

The Esthonian officials are much interested in American systems and wish an American engineer could be sent there to study the local conditions and to recommend and make offers on the system that is best adapted to local needs.

New Gas Furnace for Melting Soft Metals.

To meet the demand for a low-cost, medium-sized gas furnace for melting soft metals, the Johnson Gas Appliance Co., Cedar Rapids, Iowa, announces its No. 300 furnace. This furnace stands 28 inches high, weighs 100 pounds and has a removable cast iron melting pot holding 150 pounds.

Its three Johnson patented atmospheric bunsen burners are stated to develop any desired temperature up to 2,250° Fahr., and to consume only about 40 cubic feet of gas per hour. Burners have shut-off valves and pilot lights. Two burners are sufficient for keeping the metal molten.

The high efficiency claimed for this melting furnace is ascribed to the Johnson direct jet regulator in its bunsen burners.

This regulator, with an orifice that can be instantly adjusted to any pressure

The Johnson Medium Size Gas Furnace and Burner.

or quality of gas, sends a sharp, solid jet of gas with great force up the center of the mixing tube at main pressure without the use of forced air blast or blower, producing the highest possible flame temperature.

Further details may be obtained upon application to the manufacturer, the Johnson Gas Appliance Co., Cedar Rapids, Ia.

Relocation of Pole Lines on Account of Hard Roads.

The Illinois Telephone Association in a recent bulletin to members says:

"It is inevitable that in some cases the construction of hard roads will necessitate the relocation of your telephone pole lines.

"You are warned, however, against needless shifting of your pole lines, and this office suggests, when you are advised that a pole line must be moved, that you insist upon having such advice and an official relocation of your line come from an authorized representative, such as the engineer in charge, of the Division of Highways, Department of Public Works and Buildings. Refuse to shift your lines upon any request made by the contractor, unless it is supported by such official notice."

Picnic of Benton Telephone Association at Gay Park, Ind.

The Benton Telephone Association is going to have a picnic on July 20 at Gay Park, Ind., which is five miles east of Brookston.

Every year the members of the Benton association get together at one of these summer picnics and so thoroughly enjoy themselves that they always come back the next year.

The Policy

of Lynton T. Block & Co. is to issue the most satisfactory and comprehensive insurance to be had anywhere—

Furnishing absolute protection at cost.

Embodying all the standard features and more.

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Selling at established rates.

Returning savings at the end of the policy period, depending upon the individual experience of the risk.

Giving a claims service that is not equalled elsewhere.

It is an honest policy, carried out in an honest way and gives a square deal under all conditions.

This forms the creed of every member of the organization and has built up the reputation of Lynton T. Block & Co. until it is one of the best and most favorably known in the Mississippi Valley.

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